Cobalt59

Capacity Building and training needs analysis: Stage 1 Report

"Are new developments cleaning up the Cooks River or creating more problems?"

FINAL

Brian Keogh

24 June, 2016

Report Basis

This report partially fulfils two Cobalt[59] requirements:

- It provides a baseline evaluation of the capacity of the Cooks River councils within a critical systems area (planning assessment in relation to water management).
- It provides a training assessment that will assist in developing this capacity.

Contents

1. Executive Summary

This report responds to capacity building actions in the Cooks River Alliance (CRA) Action Plan 2014-2017.

State Environment Protection Policies (SEPP)

- The Cooks River has no adequate consistent catchment wide environmental protection in relation to development beyond BASIX.
- The draft Coastal Management SEPP is unlikely to provide catchment wide environmental protection. Present drafts do not include the headwaters of the Cooks River catchment (above the tidal area), however councils can 'opt in'. It is unlikely these councils will choose this option in the near future.
- The protection sort (Water Sensitive Urban Design as mandatory) is business as usual in Victoria, South Australia, Queensland and the ACT.

Recommendations:

1. *The Alliance advocates for one SEPP addressing the entire Cooks River, the Georges River, the Hawkesbury Nepean, the Sydney Harbour Catchment which includes WSUD as mandatory in all developments. This SEPP would replace the present separate SEPPS for these areas and create an even foundation for all developments along the urban rivers of Sydney.*

2. *The Alliance advocates for the 'opting in' to the draft Coastal Management SEPP by the new council areas of Canterbury Bankstown, Inner West, Cumberland, and Georges River councils. In addition, the Alliance advocates for the 'opting in' of the Burwood and Strathfield Councils separately, or Burwood/Canada Bay/Strathfield (pending council area) jointly.*

3. *The Alliance explore and pursue funding opportunities to develop a Coastal Management Program under the Coastal Management Reforms for the appropriate Minister to certify.*

Local Environment Plans (LEP)

- The standard format LEP applied across NSW largely eliminated the effectiveness of planning provisions for stormwater control in relation to sustainable urban water management (SUWM).
- Provisions within the range of LEPs reviewed still contain some variations which may provide opportunities for provisions which enhance WSUD controls in planning.

Recommendation:

4. *The Alliance develop and adopt a standard LEP stormwater clause for all council areas,*
5. *The Alliance advocate for the adoption of a standard LEP stormwater clause in the creation of new LEPs for amalgamated council areas. At the minimum this would be a development on the Botany Bay and Rockdale LEP section 6 clauses for* ***stormwater management*** *and* ***riparian land and watercourses****.*

Development Control Plans (DCP)

Targets

- **Adoption:** Stormwater quality targets are important both for consistency across the catchment, and to gain an understanding of how much development controls contribute to changes in total pollution. Just over half the pre-amalgamation (7 out of 13) council areas have targets for stormwater quality consistent with the Botany Bay Water Quality Improvement Plan Targets.

- **Monitoring against targets:** The City of Sydney is creating a MUSIC model which will be used to measure, monitor and report against the City's stormwater quality target. This approach has obvious catchment wide possibilities. The Alliance should assist with the development of this model, using this as a pilot for measuring targets on a catchment wide basis.

Recommendations:

6. *The Alliance advocate for Member Councils' adoption of the Botany Bay Water Quality Improvement Plan stormwater targets including the use of these targets in all Cooks River catchment council Development Control Plans (DCPs)*

7. *The Alliance assist develop a MUSIC model for the catchment, based on experience gained with the City of Sydney's model, to measure, monitor and report against stormwater quality targets. This is a unique opportunity to create a pilot process for the broader catchment.*

WSUD Controls

Objectives of DCPs

"According to the principles of best practice management, urban stormwater should be managed to minimise impacts on waterway health, minimise stormwater flooding and provide an alternate water source.[1]"

DCPs that don't have waterway health and alternative sources of water objectives (or have these objectives in name only) still have significant credence. The pre-amalgamation council areas where this exists are:

a. Ashfield
b. Burwood
c. Canada Bay
d. Canterbury
e. Hurstville

Pre amalgamation council areas which have some controls, but development size limits the effectiveness are:

a. Leichhardt
b. Strathfield
c. Bankstown

Pre amalgamation council areas which have commitment to best practice are

a. Botany Bay

[1] http://www.environment.nsw.gov.au/stormwater/ accessed 15 June 2016

b. City of Sydney
c. Kogarah
d. Marrickville
e. Rockdale

Recommendations

8. *The Alliance develop a best quality DCP in relation water management*

9. *The Alliance advocate for the adoption of a best quality DCP in relation to water management by all members.*

10. *The Alliance provide best practice policy development training available for policy and DCP development regarding water management.*

Development size

Overview

All Members' DCPs concerned with water management have thresholds for development size where different detail is required for assessment. Developments larger than this threshold are required to submit modelling (MUSIC or equivalent). This modelling provides a more comprehensive approach to strategies to tackle urban stormwater hydrology and pollution impacts that are site and development specific. These thresholds range from 1000m^2 to 5000m^2 (with various other permeations). The rationale for this variance isn't obvious.

Standards

Perversely the standards for water management are higher the closer the council area is to Botany Bay. These are the areas that will have the least effect on cumulative water quality outcomes.

Recommendations:

11. *The Alliance create a common development size threshold for requiring MUSIC modelling to be submitted with development applications.*

12. *The Alliance advocate for adoption of the common size development threshold by all Members, and catchment councils.*

13. *The Alliance create common standards for water management that are consistent with quality WSUD.*

14. *The Alliance advocate for adoption by all Members of the common standards for water management that are consistent with quality WSUD.*

Assessment ('deemed to comply')

Automated system

Kogarah is the only council to provide an automated online assessment for developments under the threshold for which MUSIC modelling would be considered.

The advantages of Kogarah's system are the planning assessments for water management below the threshold are simplified, while still maintaining a site specific approach.

MUSIC modelling

This is the accepted standard for development applications above the threshold development size. The use of MUSIC within different councils is inconsistent.

Recommendations:

15. *The Alliance develop a 'deemed to comply' process and guideline for councils that require it. The Alliance investigate the Kogarah online tool for suitability.*

16. *The Alliance advocate for adoption by Members of the 'deemed to comply' process and guidelines.*

17. *The Alliance provide MUSIC training tailored for Members (see next section).*

18. *The Alliance provide 'deemed to comply' training for DCP requirements around WSUD (see next section)*

Training Recommendations

These training recommendations aim at increasing the sustainable urban water management capacity within the Alliance councils. To be effective, as far as practicable, the training should be council specific. Effective training in the areas suggested should be intensive, and work towards a definite outcome for the Cooks River.

1. MUSIC modelling training

   The recommended course is the customised/ in-house course offered by eWater http://ewater.org.au/products/music/music-training/customised/. This customised training should be for developing projects related to the Cooks River. Hurstville (Georges River Council) have expressed an interest already. The City of Sydney is also working on a model to measure total stormwater pollution reduction. The Alliance should use the City of Sydney experience as a pilot to develop a model for the total catchment.

   Rationale:
   Modelling relies on targets. Targets can be drivers of real change. The adoption of targets means modelling skills within each council are essential. Some councils have high levels of MUSIC skills, however for others councils this development has not occurred. In addition, catchment wide MUSIC modelling should be an aim for the immediate future. This needs to be an innovation the Alliance invests in.

2. "What constitutes good design in WSUD?" training

   This is a course for assessment planners so they are more cognisant with the best developments in design for WSUD. This is a generalised training recommendation that could engage a range of 'actors'.

   Rationale:
   WSUD design is continually improving and developments need to be assessed for the most effective outcomes. This is, again, an area of innovation that the Alliance should invest in as 'core business'.

3. "Deemed to comply" training for DCP requirements around WSUD.

   This requires the development of a course and tools for development assessment for planners. The course should deal with small and large developments separately. Small developments should have a streamlined process that enables easy demonstration of best practice in relation to WSUD. Large developments assessment needs to incorporate modelling options.

   Rationale:
   Development assessment planners are under continual pressure to produce timely assessments. This is a critical area to create efficiencies. This kind of training will assist in quality assessment and successful adoption of best practice WSUD.

4. Policy/DCP development training.

   This involves training/workshops to harmonise the LEP/DCP requirements for water across the Alliance. This could theoretically feed into the development of a Catchment Management Plan to be used in the Coastal SEPP.

Rationale:
Because of amalgamations council policies will be reviewed and harmonised across the old councils' suite of policies. An opportunity exists to create best practice policy. In addition, there is some suggestion that NSW Planning and Environment want to harmonise DCPs across the state. A united Alliance front in these areas would be prescient.

Policy has been the basis for council DCP requirements. Water Sensitive Urban Design continues to develop, and as a consequence, so should policy and DCP requirements.

2. Capacity Assessment – Systems

This report responds to actions 1.1.1 and 1.1.2 in the Cooks River Alliance (CRA) Action Plan 2014-2017.

The Cooks River Alliance (CRA) Action Plan lists seven programs. Program 1 addresses capacity building. The program's purpose is to increase members' skills and knowledge, including with Aboriginal advisory committees, for action on catchment health and sustainable urban water management. Objective 1.1 is to determine, develop and deliver capacity building opportunities for member councils.

The CRA has retained Cobalt59 to undertake evaluations of efficiency and impact under the Monitoring, Evaluation, Reporting and Improvement Plan for the Caring for Country Grant. Efficiency is being evaluated by assessing individual grant activities against specific measures. Those measures are being tailored to the activity evaluated. The impact evaluation is evaluating changes in CRA Member Councils' capacity for sustainable urban water management. A methodology is being employed based upon a typology of organisational capacity developed by Annette Bos[2] using an adjuested capacity assessment originally developed by McKinsey & Company[3]. The methodology includes:

- Desktop analysis of member Council's strategic plans produced under the strategic planning process for local government in NSW, the Councils detailed organisational structure, and the skills of key staff members.
- Two surveys:
- Survey 1: Senior staff and key influencers
- Survey 2: Staff specifically connected with elements of water sensitive urban design.
- Interviews and focus groups with council staff, and the General Manager and Councillor representation on the Alliance
- Observation of meetings of the Alliance's Management Committee, Steering Committee and Action Groups.

Due to the comprehensive nature of the evaluation and close dealings with Members, the CRA considered it sensible for Cobalt59 to be retained to assist with capacity building.

Cobalt59 used a mixed methods approach to both the capacity assessment and training needs assessment. This involved focus group questions and a general question in Survey 1.

This capacity assessment and training needs assessment surrounds the capacity of the Cooks River Alliance councils in relation to **'systems'** within the Bos[4] framework, specifically the 'planning and development' element of **'systems'**.

This area was chosen for particular focus for the following reasons:

1. These **system** elements of the capacity measures are in the public domain and so the confidentiality of particular councils is not compromised. NSW does not have a clearly legislated policy on urban stormwater quality and flow objectives[5]. It can be

[2] Bos, J. J. "Transition-Oriented Governance Processes for Enabling Sustainable Urban Water Management" unpublished PhD thesis, School of Geography and Environmental Science, Monash University, February 2013. As part of this thesis, confidential reports were given to Alliance Councils

[3] Waterman, R. H., Peters, T. J., & Phillips, J. R. (1980). Structure is not organization. Business Horizons, 23(3), 14-26.

[4] Bos, J. J. (2013) Op. Cit.

[5] Choi, L, McIlrath, B. (2016), **New South Wales'** *Planning Framework for Water Sensitive Urban Design*, Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities p. 16

argued that councils, with local knowledge and experience, have an advocacy role in this area.

2. The Botany Bay Water Quality Improvement Plan identified reductions from large and small developments as the primary way to reduce pollutant loads. Botany Bay is the receiving waters for the Cooks River[6] and this plan is aimed at protecting the Ramsar listed wetlands of Botany Bay.

3. The decentralised Water Master Plan prepared by GHD for the City of Sydney in 2012[7] identified the biggest and most cost effective gains in stormwater pollution reduction for the City in relation to the Cooks River were possible through development controls.

4. In 2016 the CRC for Water Sensitive Cities released a review of NSWs' Planning Framework for Water Sensitive Urban Design[8], and this review offers an opportunity to apply a deeper analysis to the Cooks River providing a range of opportunities for improvement to the present situation.

The amalgamation of various councils within the Cooks River Alliance also presents an opportunity for the advocacy of the establishment of the best sustainable urban water policies to promote within the new council structures. This means either choosing the most suitable policy from the amalgamated group or promoting a new 'best practice' approach.

[6] http://greatersydney.lls.nsw.gov.au/land-and-water/water/botany-bay-water-quality-improvement-plan accessed 1/6/2016
[7] http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0009/130500/130218_EC_ITEM02_ATTACHMENTD3.PDF accessed 15/5/2016
[8] Choi, L, McIlrath, B. (2016), **Op. Cit.** .

3. Background

Key Points:

- **Historically there has been poor direction from State Government in relation to water management and planning in the Cooks River catchment.**

- **Most council provisions presently contained in Local Environment Plans, concerning the 13 LEPs reviewed, are of little use for stormwater control (or any water control).**

- **Development Control Plans (DCPs) need to be looked at in detail to understand if this instrument can provide assistance.**

In 2010, Annette Bos carried out an extensive study of the capacity of each council to implement sustainable urban water management. One her general findings was:

> *The current external rules provide a very limited direction for developing and implementation of Sustainable Urban Water Management. Respondents clearly identified a lack of direction from State Government, which can leave councils with limited incentives to act.*[9]

This is still the same situation six years later, although some possibilities do exist. This finding is covered in more detail below in the '***Planning Overview'*** section. State Government direction given through the state environmental protection policy BASIX is looked at in detail.

In relation to planning instruments which councils have some direct control over, some consideration needs to be given the local environment plan (LEP). Research with councils show that this plan is largely written to conform to set clauses and has little meaning in relation to water management and development applications. Previous efforts to strengthen provisions for water management in LEPs were frustrated. This is discussed in the '***Local Environment Plans'*** section.

The original measurements of planning controls used by Bos[10] in 2010 were simplistic (it was beyond the scope of her study to go into finer detail). The data collected was based to a large extent on interviews and survey data. Two years later in 2012, the City of Sydney commissioned a study that found:

> *"Incorporation of WSUD (water sensitive urban design) within re-development is the most cost effective way of disconnecting stormwater flows and pollutants from polluting the waterways."* [11]

To understand the situation with each council area in greater detail, it is necessary to evaluate the relative effectiveness of each council's DCP for SUWM based on published DCPs. The ***Development Control Plans*** section below further develops two of Bos's criteria.

1. DCP requires water sensitive urban design in all new developments, both small and large scale.

---

[9] Bos, A., Organisational Capacity for Sustainable Urban Water Management Canterbury City Council, June 2010
[10] Bos, J. J., 2013, Op Cit.
[11] City of Sydney "City of Sydney Decentralised Water Master Plan 2012-2030" July 201 p. 43

2. DCP (Development Control Plans) for SUWM (Sustainable Urban Water Management) are well understood and implemented.

4. Planning Overview

Key Points:

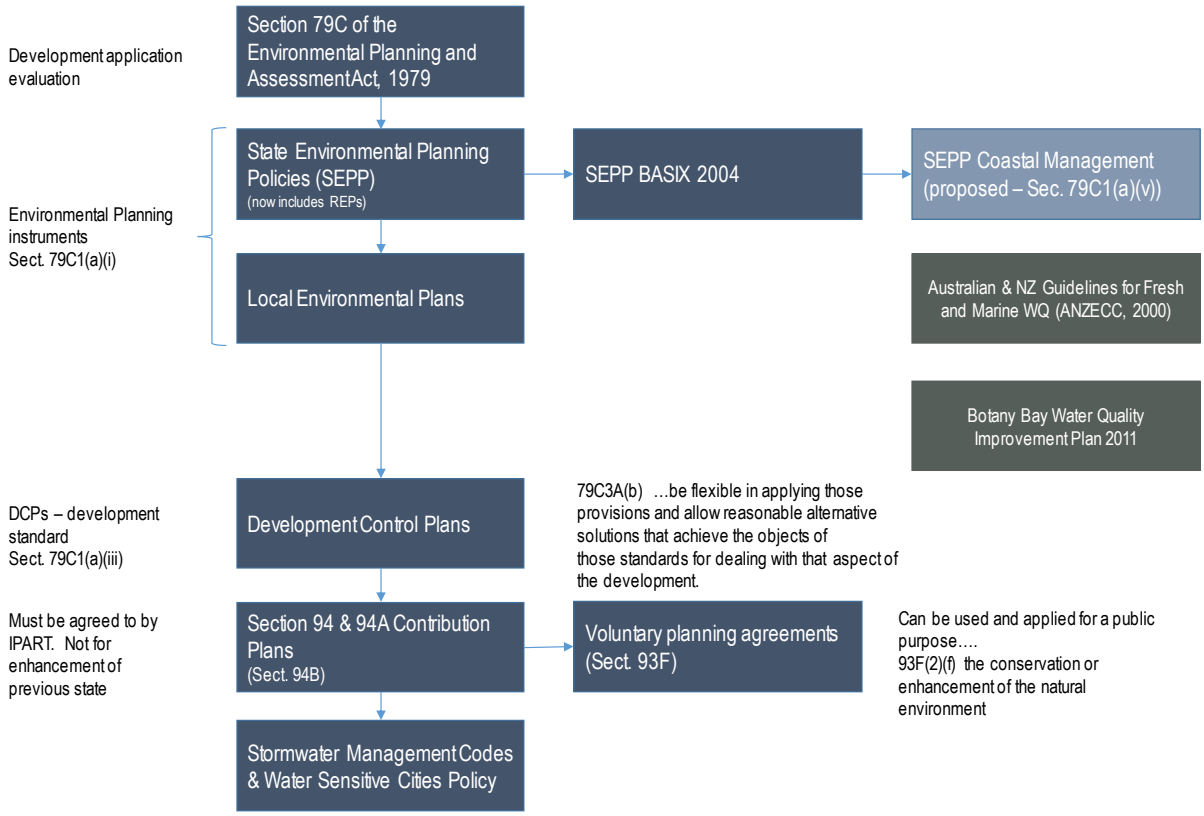
- ***The Cooks River has no consistent catchment wide protection in relation to water management and development beyond BASIX.***

- ***Potentially the new Coastal Management SEPP could fulfil this purpose. Present drafts do not include all of the Cooks River catchment, however councils can 'opt in'.***

Development controls should be a primary focus in the struggle to clean up the Cooks River. Ensuring sustainable urban water controls means stormwater pollution problems are not perpetuated with new developments, potentially around for the next forty years[12].

The NSW government has made councils responsible for development approvals, however the State government overrides council determined controls via State Environmental Planning Policies (**SEPPs**). The full hierarchy of legislation regarding development approvals, applying to the Cooks River catchment, is given below in *Figure 1: Hierarchy of Planning Instruments for Development Applications.*

Figure 1: Hierarchy of Planning Instruments for Development Applications



[12] The life cycle of developments has many elements. Of interest is the following article (more about "infill" in Sydney). Newton, P., Newman, P., Glackin, S., & Trubka, R., "Greening the Greyfields: Unlocking the Redevelopment Potential of the Middle Suburbs in Australian Cities", Internation Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, Vol. 6, No: 11, 2012

New legislation is this hierarchy is currently in the NSW Legislative Assembly. This is the proposed SEPP Coastal Management Bill 2016. The draft legislation presently shows the SEPP will apply to some sections of the Cooks River. These sections are defined as 'estuaries', and the 'prior to amalgamations' council areas concerned are Botany Bay, Burwood, Canterbury, Marrickville, Rockdale and the City of Sydney. This translates into the new council areas of City of Sydney, Canterbury Bankstown, Inner West, Burwood/Canada Bay/Strathfield (pending) and Botany Bay/Rockdale (pending).

The Coastal Management SEPP allows for the formation of a Coastal Management Program (a plan) which comes into force if the Minister certifies this plan (and it's published in the Government Gazette).

Under this SEPP, the Cooks River is classified as a '**Coastal use area'.** As such an area, one of the management objectives (Part 2,9(2)(iii) is:

"urban design, including water sensitive urban design, is supported and incorporated into development activities"

This means the inclusion of suitable water sensitive urban design elements into the assessment of development applications could not be overridden.

The limitations to this plan could be the area that is defined as land adjacent to *'coastal waters, estuaries, coastal lakes and coastal lagoons'* (the definition of 'coastal use area'). The headwaters of the Cooks River are not tidal (therefore not an 'estuary') and are a long way from the coast. These are the areas that most need state regulation because of the lack of visibility of these areas to the public. The contribution to Cooks River pollution from these areas is more potent because of the lack of natural filtering aspects. Will these areas be considered to be 'adjacent' to the 'coastal environment area'?

In the Georges River, the coastal management plan covers the river section from Liverpool Weir to Botany Bay. Liverpool Weir is recognised as the tidal limit of the Georges River and this is the limit of the 'estuary'. This plan was not extended beyond the tidal area.

The Cooks River Stormwater Management Plan[13] produced in 1999 outlined the importance of Auburn, Randwick and Hurstville in addition to the pre-amalgamation councils presently contained in the draft legislation. In the new councils' structure this would mean Cumberland and Georges River councils. For effective control, these areas need to be included.

If the adjacent land to the 'estuary' area is the land adjacent to the tidal zone then Cooks River catchment headwaters would be in the position of being effectively surrounded by higher level State stormwater controls that will not apply. This comes about because:

- Both of the Georges and Parramatta rivers have a SEPP relating to their circumstances, and in addition have Coastal Management Plans
- The 'growth areas' including Baulkham Hills Shire Council, Blacktown City Council, Camden Council, Campbelltown City Council, Hawkesbury City Council, and Liverpool City Council all have their own SEPP with high levels of WSUD controls. Although this SEPP does not apply to infill development, the planning controls for infill in these areas are stronger in relation to WSUD as a result.

[13] Cooks River Catchment Association of Councils "Cooks River Stormwater Management Plan" PPK Environment & Infrastructure Pty Ltd, Webb, McKeown & Associates Pty Ltd, September 1999.

- The coastal protection will apply to defined adjacent land to the ‘estuary sections’ of the Cooks River. These areas are larger than under the previous Coastal protection SEPP, but fall short of the headwaters areas.

All of the SEPPs listed above are superior to the BASIX SEPP. BASIX would be the only applicable SEPP to development applications within the areas of the Cooks River catchment not defined as ‘estuary’.

In addition to SEPPs, of note is ‘The Botany Bay Water Quality Improvement Plan (2011)’. This plan was created by the former Sydney Metropolitan Catchment Management Authority. It’s status is advisory only, however it is a well-considered, scientifically based plan. This plan is important because it is the only plan that refers to pollution targets in the receiving waters of the Cooks River. Continued and enhanced reference gives this plan credibility, and the plan gives the targets credibility.

At present consistent and ‘water sensitive’ planning policy for the Cooks River at the State level is completely inadequate. The next section considers the policies that do exist.

5. NSW State Environment Protection Policies (SEPPs)

The applicable NSW policies in relation to the Cooks River are the BASIX SEPP and a collection of other policies which are used for developments of a specific kind. The BASIX SEPP has the widest influence and so is discussed in detail below.

'BASIX' State Environment Protection Policy

Key Points:

The BASIX SEPP is primarily concerned with reducing water consumption. Various audits appear to show this is working. The limitations of BASIX in relation to the Cooks River are:

1. ***It doesn't cover non-residential developments***
2. ***It doesn't address the issue of the quality of stormwater leaving properties***
3. ***The audits of BASIX don't adequately measure compliance after development application lodgement.***
4. ***There is no incentive beyond regulation to reduce potable water consumption***

The target for reduction of potable water consumption is 40% along the coast of NSW. The baseline measurement for this water reduction is 90,340 litres of water per person per year[14.] (248litres per day). BASIX aims to achieve this reduction through the following:

a) Constricting water demand

i. Landscape – low water use plants. For multi-unit dwellings this includes impervious areas.
ii. Fixtures – using the water efficiency labelling and standards (WELS) scheme. This rates shower, toilets and taps (kitchen and bathroom) for water efficiency.
iii. Pool and spa covers

b) Encouraging harvest and reuse of water

i. Rainwater and stormwater tanks (with use in toilets and gardens)
ii. Greywater and waste water recycling (particularly for toilet and garden use)
iii. Hot water recirculation or diversion systems

BASIX's applies to all residential development – single, multi-dwelling, flats and alterations and additions (over $50000). It has no application to commercial or industrial developments, and so it is reliant on council development control plans (DCPs) to stipulate any requirements for water sensitive urban design measures for these developments.

BASIX has no requirements relating to the quality or velocity of water leaving a development, in particular stormwater. Any controls in this area for new developments are subject to council development control plans (DCPs).

The audits of the success of BASIX in relation to water consumption have been sporadic. The last audit publicly available was by Hydrosphere Consulting covering 'Rous Water' in

[14] https://www.planningportal.nsw.gov.au/planning-tools/basix accessed 1/6/2016

Ballina[15]. This was completed in September 2013. The audit found that BASIXs did achieve its aim of a 40% reduction in water consumption over non-BASIX approved dwellings. This was despite wide variations between expected use on the basis of the development applications, and the actual use, suggesting compliance to approved development applications may be irregular. There has been no study on compliance following approval.

In a survey of building professionals in 2013, low-water landscaping was perceived to be least effective in BASIX, and difficult to audit[16] This same survey found building professionals thought a key motivation for households to exceed minimum targets set in BASIX could be showing monetary savings through doing this.

The cost of potable water is so low there is no evidence that water tanks are a cost-effective addition to a house (or any other water saving measure). The Independent Pricing and Regulatory Tribunal[17] has additionally announced the price of water will be dramatically reduced from 1 July 2016 to 30 June 2020.

SEPSS Covering Sydney Urban Rivers

Key Points:

- **The present fragmentation of controls across coastal and river SEPPS is unnecessarily complex.**
- **The four rivers running through the Sydney urban environment should have the same general considerations in relation to development controls, particularly in relation to requirements for the inclusion of WSUD in all new developments**

The following SEPPS apply to Sydney urban rivers:

- Sydney regional environmental plan no 20—Hawkesbury-Nepean river (no 2—1997)
- Sydney regional environmental plan (Sydney Harbour Catchment) 2005
- Greater metropolitan regional environmental plan no 2--Georges River catchment

Each one of these SEPPS have different considerations and interpretations. None of these considerations apply to the headwaters areas of the Cooks River. In general these areas have the weakest controls in relation to water use and development. These areas are largely unseen by the community and so are not rated highly in public awareness. However, in river systems generally, it is these areas where protection is most needed to create a healthy waterway.

It would be more consistent and clearer to develop a general range of planning considerations for all urban waters. Specific considerations for each waterway could be included as separate clauses.

[15] Hydrosphere Consulting "Rous Water Basix Performance Report" Sept. 2013 https://www.planningportal.nsw.gov.au/planning-tools/basix p.3 Accessed 1 June 2016

[16] Zou, P., Building professionals' and homeowners' perceptions of the NSW Building Sustainability Index (BASIX). University of Canberra, October 2013, p.4

[17] http://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro_Pricing/Review_of_prices_for_Sydney_Water_Corporation_from_1_July_2016

Other State Environmental Protection Policies (SEPPs)

Key Point

- **This area needs further investigation in relation to relative impact and the influence of other SEPPs in the big picture.**

Other SEPPs determine planning assessments in certain situations.

These SEPPS override local approval processes in the case of major developments, developments which are deemed to be state infrastructure, or developments which are seen to fulfil a regional or state purpose (affordable housing or the environment).

These include:

- SEPP 71 – Coastal Protection (to be replaced, and concerning coastal councils only)
- SEPP (Major Development) 2005
- SEPP (Infrastructure) 2007

Note is made of Division 25 of SEPP (Infrastructure) 2007. "*This refers to waterway and foreshore environmental management activities, including riparian corridor management, bank stabilisation, weed management, revegetation activities, and the creation of foreshore access ways. In this regard, the relevant local Council is deemed to be the public authority, and as such, does not require development consent to undertake waterway and foreshore environmental management activities*".[18]

It is beyond the scope of this present study to present an understanding of how much development occurs under these mantles. This should be an area of additional work for the Alliance to undertake.

[18] Georges River Combined Councils Committee (GRCC) Georges River Estuary Coastal Zone Management Plan, 2013 p. 8

6. Local Government Local Environment Plans (LEPs)

Key Points

- **The standard format LEP applied across NSW largely eliminated the effectiveness of planning provisions for stormwater control in relation to sustainable urban water management (SUWM).**

- **Provisions within the range of LEPs reviewed still contain some variations which may provide opportunities for provisions which enhance WSUD controls in planning**

Local Environment Plans provide the statutory framework for development and use of land in a local government area. LEPs are statutory documents, meaning it is illegal to develop land in a way that is contrary to that permitted by the LEP.

These plans are the next level down from State Environment Planning Policies. LEPs are intended to be a means to implement strategies, giving legal effect to where and under what circumstances places should be developed or particular environmental controls imposed. All LEPs must be made in a standard form prescribed in the Standard Instrument (Local Environmental Plans) Order 2006.[19]

In June 2008, the then Sydney Metropolitan Catchment Management Authority developed a standard clause advice for Local Environmental Plans[20] (see Appendix A: Suggested Stormwater/WSUD LEP Clause). This clause was determined as not acceptable to the 'standard form' by the NSW Department of Planning and Environment. However, the NSW Department of Planning and Environment does accept reasonable stormwater clauses. The Blue Mountains LEP Clause is given in Appendix B: Blue Mountains LEP Clauses. These simple clauses applied uniformly across the Cooks River would solve significant problems.

Nine out of thirteen LEPs across Cooks River Catchment don't mention stormwater at all. However, some do. Table 1 below evaluates the relative strength of LEP provisions for stormwater.

Table 1: LEP evaluations for water management

Council	Previous Council	LEPs	Evaluation
City of Sydney	City of Sydney	No specific stormwater provisions	☒
Canterbury Bankstown	Bankstown	No specific stormwater provisions	☒
	Canterbury	*6.4 Stormwater Management*	☑
Georges River	Hurstville City	No specific stormwater provisions	☒

[19] http://www.planning.nsw.gov.au/~/media/Files/DPE/Manuals-and-guides/a-guide-to-preparing-local-environmental-plans-2013-04.ashx

[20] Botany Bay Coastal Catchment Initiative "Incorporating Appropriate Stormwater Management/WSUD Requirements in Local Environment Plans (LEPs)" June 2008 http://www.wsud.org/wp-content/uploads/2012/07/Final_Stormwater-_LEP_Advice25June08.pdf Accessed 2 June 2016

Council	Previous Council	LEPs	Evaluation
	Kogarah City	No specific stormwater provisions	☒
Inner West	Ashfield	No specific stormwater provisions	☒
	Marrickville	No specific stormwater provisions	☒
	Leichhardt	*6.4 Stormwater Management*	☑
Burwood/Canada Bay/Strathfield (the formation of this new council area is a proposal at this stage)	Strathfield	No specific stormwater provisions	☒
	Burwood	No specific stormwater provisions	☒
	Canada Bay	No specific stormwater provisions	☒
Botany Bay/Rockdale (the formation of this new council area is a proposal at this stage)	Rockdale	*6.7 Stormwater* *6.5 Riparian land and watercourses*	☑
	Botany Bay	*6.3 Stormwater Management* *6.5 Riparian land and watercourses*	☑

Evaluation scale:

- **Higher level considerations** ☑
- **Some considerations** ☑
- **Minimal considerations…** ☑
- **No considerations** ☒

The council areas of Rockdale and Botany Bay both have an additional 'Riparian land and watercourses' clause. These are given in 'Appendix C: Botany Bay Stormwater and Riparian LEP clauses'. In addition, both these areas have strong water sensitive urban design Development Control Plan (DCP) controls.

Kogarah, the City of Sydney and Marrickville have no water management requirements within their LEP, but yet still have comprehensive 'water sensitive city' requirements within their DCP.

The table above however, shows that LEPs are at present a minor part of the picture.

7. Local Government Development Control Plans (DCPs)

Development Control Plans (DCPs) are non-statutory instruments that support the LEPs. In general, a DCP cannot contain controls which require a higher standard for developments than NSW state laws. For areas not covered by BASIX, the interpretation of which laws apply is broad. The legislation also stipulates that the application of DCP provisions should be done with 'flexibility'. Section 79C3A(b) of the Environmental Planning and Assessment Act, 1979 states that councils need to:

> *"…be flexible in applying those provisions and allow reasonable alternative solutions that achieve the objects of those standards for dealing with that aspect of the development."*

This creates an obvious weakness in DCPs, so the best solution would be uniform State legislation covering the whole of the catchment. This should contain the standard of sustainable urban water management which is encompassed in more recent State legislation for other areas.

However, at present the application of WSUD principles still has to be council specific. This makes the evaluation of the present DCPs important. The evaluation method is given in brief below.

Evaluation Method

Council DCPs are very different across council areas, both in terms of how they are written and what provisions they contain. Comparing like with like is a tedious process. While some DCPs have general stormwater requirements for all developments, others have requirements contained within a particular development type.

In evaluating the controls within DCPs for sustainable urban water management[21] , the following framework has been used. Sustainable urban water management is an integrated approach to water supply, sewerage and stormwater management that aims to better reflect all stages of the natural water cycle to enhance social, ecological and economic sustainability at scales. In simple terms sustainable urban water management has three elements:

a. Reducing potable water use
b. Keeping water in the landscape - via harvesting and reuse, and absorption into the ground
c. Stormwater quality - improving the quality, volume and velocity of stormwater leaving a property

To support these outcomes, the following other areas were considered:

- Modelling and targets for assessment,
- DCP objectives surrounding Water Sensitive Urban Design
- The application of different controls for different size developments.

The rationale and particulars for each part of this framework appear in *Appendix C: DCP Evaluation Method*.

[21] This term is used interchangeably with Water Sensitive Urban Design (WSUD)

Botany Bay/Rockdale

Main Points:

- **Both councils have extensive stormwater absorption areas – Botany Bay requires this to be considered as a first option**

- **Botany Bay controls are simpler to understand, however both DCPs strongly embrace WSUD controls.**

- **These councils have amongst the strictest controls in relation to water management.**

Botany Bay

The primary objective of the water provisions is the application of water sensitive urban design. The targets used are from the Botany Bay and Catchment Water Quality Improvement Plan.

Smaller developments need to provide a 'water management statement' (less than 16 dwellings), outlining WSUD measures. Above this amount an 'integrated water cycle plan' must be provided. An **Integrated Water Cycle Plan** is a summary of water conservation measures to be applied on site, including an estimate of total water demands and expected savings associated with water conservation measures, as well as details on how water demands will be managed and monitored.

New developments with total sites above 1500m^2 must provide music modelling, and if on-site infiltration for stormwater is possible this must be used as a first option.

Table 2: Botany Bay DCP water management controls

Botany Bay								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX	Absorption pits			
Flats		Yes	BASIX	BASIX	Water management plan		Yes	Water management Stmnt <16Dwls Water Cycle Plan >15Dwls
Other developments								
All		Yes	BASIX requirements	Requires the re-use of stormwater	BBWQIP Standards Stormwater Quality Improvement Devices must be used		Detailed WSUD strategy	On-site infiltration to be used as first option OSD[22] Maintenance schedules
<1000m^2								
1000m^2 to 2000m^2						>1500m^2 must use MUSIC		
2000m^2 to 4000m^2								
>4000m^2								

[22] OSD refers to On Site Detention

Rockdale

The principles applied for water management are water sensitive urban design (WSUD). WSUD however does not apply for additions to existing single dwelling houses. For all other developments it does apply.

The technical specifications for stormwater management are difficult to understand regarding the threshold development sizes. Major developments are above 60m^2 of impervious area – which appears to be the threshold were WSUD applies. The WSUD standards require tanks, reuse of water, and stormwater must conform to the Botany Bay Water Quality Improvement Plan guideline targets. Music modelling is required for larger developments.

Developers submit a 'Stormwater Concept Plan' initially – not detailed design, but demonstrating the drainage system can be integrated into the sites overall water management. A detailed stormwater plan (incl. maintenance provisions) must support the Complying Development Certificate. This plan shows all the WSUD provisions.

Table 3: Rockdale DCP water management controls

Rockdale								
Development	**No requirements**	**BASIXs only**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX	Nothing for		Secondary dwelling & dual occupancy	Absorption pits (where possible)
Flats		Yes	BASIX	Lrg MD WSUD	Lrg MD WSUD		60m^{2}of impervious area min. rqmts >60m^2 WSUD	
Other developments								
All			Min WELS standard (4 star taps, 3 star showers, 4 star toilets, 3 star urinals	OSD offset with tanks requiring retention and reuse	BBWQIP Targets Unclear threshold for MUSIC modelling requirement.	Large dvlpmts use MUSIC. Smaller ones apply same principles (p.38 TSstorm)	Comprehensive	Absorption pits (where possible) Stormwater Concept Plan
<1000m^2								
1000m^2 to 2000m^2								
2000m^2 to 4000m^2								
>4000m^2								

Burwood/Canada Bay/Strathfield

Main Points:

- **Burwood and Canada Bay have the weakest DCP controls for water management amongst all DCPs reviewed.**

- **Burwood's 'Stormwater Management Code' hasn't been updated since 1994.**

- **Strathfield's DCP controls are similar to Marrickville's (strong), however the development thresholds for application are large, reducing its effectiveness.**

Burwood

The only control beyond BASIX in the Burwood DCP is on-site detention.

There are no requirements for anything other than on-site detention for 'other developments' (not even the BASIX minimum).

A stormwater concept plan is required to be submitted to Council in accordance with the Council's "Stormwater Management Code". The only guidance this code gives to stormwater quality is a reference to legislation that has been replaced over 16 years ago.

Table 4: Burwood DCP water management controls

Burwood								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX				OSD is some situations
Flats		Yes	BASIX	BASIX				OSD
Other developments								
All	No requirements for BASIX min standards on 'other development'							OSD[23]
<1000m^2								
1000m^2 to 2000m^2								
2000m^2 to 4000m^2								
>4000m^2								

[23] OSD refers to on-site detention requirements

Canada Bay

Canada Bay has a WSUD page on it's website, but no controls within the DCP. Rainwater use is encouraged, not required. On site absorption is allowed (under special circumstances), not encouraged.

Although one of the objectives is "ensure development does not have an adverse effect on water quality or drainage systems", this is applied only to the construction phase. The other water control devices refer to gross pollutants only.

Some reference is made to minimising hard surfaces, water reuse and the grouping of plants.

Table 5: Canada Bay DCP water management controls

Canada Bay								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX				OSD is some situations OSA allowed, not encouraged
Flats		Yes	BASIX	BASIX				OSD
Other developments								
All	No requirements for BASIX min standards on 'other development'							OSD[24]
<1000m^2								
1000m^2 to 2000m^2								
2000m^2 to 4000m^2								
>4000m^2								

[24] OSD refers to on-site detention requirements

Strathfield

Strathfield's Stormwater Management Code was created in1994. In July 2011 Part N- "Water Sensitive Urban Design" was added to DCP.

These WSUD controls are very clear with a high quality fact sheet, and other reference material. It requires proposed developments to prepare capital, operation and maintenance cost estimates of proposed 'water cycle management' measures. The targets adopted are the Botany Bay Water Quality Improvement Plan targets. MUSIC modelling is required for developments above a certain size.

These WSUD controls apply to developments greater than 2000m^2 (or three allotment subdivisions, whichever the smaller) and industrial lands greater than 1500m^2. It's unclear if there are any controls on smaller developments for water management.

Table 6: Strathfield DCP water management controls

Strathfield								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX			Subdivisions (3 or more) >2000m^2	
Flats		Yes	BASIX	BASIX			>2000m^2	
Other developments								
All					BBWQIP Targets	Yes	10 or more car spaces	
<1000m^2								
1000m^2 to 2000m^2	No requirements for BASIX min standards on 'other development' less than the min sizes		Min WELS standard (4 star taps, 3 star showers, 4 star toilets, 3 star urinals	Rainwater tanks, dual reticulation for toilet, laundry, irrigation, cooling towers.	BBWQIP Targets	Yes	>1500m^2 for new Dev. >1000m^2 for adtns to sites >2000m^2	
2000m^2 to 4000m^2								
>4000m^2								

Canterbury Bankstown

Main points:

- **The Bankstown WSUD development controls only apply to the very largest developments in the catchment (>5000m^2). Below this threshold the requirement is the WELs rating requirement for fixtures and fittings.**

- **Canterbury has controls at the lowest standard for water management of those DCPs reviewed**

- **This council area collectively has the weakest controls for new developments and/or the extension of existing developments (dwellings or other developments) in relation to water management.**

Although Bankstown Council appears to be moving towards a WSUD planning controls approach to new developments, the threshold size is considerably larger than any council reviewed. The controls under this threshold are less than what a single dwelling would apply through BASIX.

.

Bankstown

The Bankstown development controls only apply to the very largest developments in the catchment (>5000m^2). The 'matters to be addressed' in a site water management plan are consistent with WSUD 'matters', however WSUD is not explicitly mentioned. The controls below the 5000m^2 threshold are amongst the weakest controls in the catchment area. The requirement is for WELs rating for fixtures and fittings only, less than BASIX requirements for dwellings.

In relation to developments above 5000m^2 a '**site water management plan'** is required. This asks for an outline of how water will be captured and reused on site, and how the quality of waste water to be disposed of is controlled. This water management plan potentially encapsulates water sensitive urban design in every aspect, however the specifications around what proposals would be 'deemed to comply' are unclear.

Table 7: Bankstown DCP water management controls

Bankstown								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX	No targets			
Flats		Yes	BASIX	Site management plan >5000m^2	>5000m^{2}new Or where extension >50% of floor area			>5000m^{2}new Or where extension >50% of floor area
Other developments								
All		No	WELs rated fittings & fixtures SH = 3 stars Basins = 6 Toilets = 4					>5000m^{2}new Or where extension >50% of floor area
<1000m^2								
1000m^2 to 2000m^2								
2000m^2 to 4000m^2								
>4000m^2		No	*Site water management plan*	*Site water management plan*	*Site water management plan*			Site water management plan

Canterbury

This rates as one of the poorest DCPs in relation to water management controls. This is surprising giving the large open sections of the Cooks River that run through the area, and the leadership role Canterbury politicians have taken in relation to the Cooks River.

Canterbury planning controls are still primarily a drainage model – with detail relating to on-site detention only. There are no objectives relating to any approach that may incorporate WSUD. The only requirement for water management regarding 'other developments' is a WELS rating on fixtures and fittings.

Table 8: Canterbury DCP water management controls

Canterbury								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX	No targets			no dvlpmt size requirements
Flats		Yes	BASIX	BASIX				no dvlpmt size requirements
Other developments								
All			Use 3&4 star rated fixtures & fittings. Install flow regulators					OSD with pits and grated drains
<1000m^2								
1000m^2 to 2000m^2								
2000m^2 to 4000m^2								
>4000m^2								

City of Sydney

Main points

- **The City has comprehensive WSUD controls in the DCP with targets consistent with the Botany Bay Water Quality Improvement Plan targets.**

- **<1000m^2 developments are dependent on 'deemed to comply' assessments as to how the 'flow of pollutants' is less.**

- **The City additionally has targets for expected outcomes for these DCP controls in relation to total stormwater pollution reduction.**

Implementation has faced some challenges. Further development of systems is needed across the following areas:

- Technical guidelines for 'deemed to comply' solutions for WSUD in new developments that simplify development assessment procedures for councils

- The continual development of the City's MUSIC model which will be used to measure, monitor and report against the City's stormwater quality target

City of Sydney

The objectives in the DCP General Provisions Section 3.7 Water and Flood Management are:

- Ensure an integrated approach to water management across the City through the use of water sensitive urban design principles.
- Encourage sustainable water use practices.
- Assist in the management of stormwater to minimise flooding and reduce the effects of stormwater pollution on receiving waterways.

MUSIC modelling (or equivalent) is required for developments above 1000m^2, with smaller developments designed 'so the flow of pollutants is less'. The City also has controls around irrigation water, which must be from a recycled source.

Table 9: City of Sydney DCP water management controls

City of Sydney								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX	Targets	Implied above 1000m^2	Requirements for engineer with experience in WSUD	OSD
Flats		Yes	BASIX	BASIX	Targets	Implied above 1000m^2	Requirements for engineer with experience in WSUD	OSD
Other developments								
All		No	Highest WELs rating at time of development		<1000m^2 designed so 'flow of pollutants is less'		Requirements for engineer with experience in WSUD	OSD 1. (Non res) tanks & plumbing 2. Dual reticulation 3. Separate meters 4. Cooling tower controls
<1000m^2								
1000m^2 to 2000m^2			Highest WELs rating at time of development	Irrigation water must be from recycled sources	>1000m^2 has BBWQIP targets	Implied above 1000m^2		
2000m^2 to 4000m^2								
>4000m^2		No						

Georges River

Key Points:

- **Hurstville planning controls in relation to WSUD are weak, and lack targets.**
- **The Kogarah DCP incorporates WSUD for nearly all developments**
- **In Kogarah, larger developments have clear targets that can be modelled, smaller developments have assistance online**

The planning controls in relation to water management by developments are far stronger in Kogarah than Hurstville.

Kogarah is focussed on all aspects of WSUD and has created a tool to provide greater understanding. This applies to all new developments above $50m^2$ or where the impervious area is above 70%. It also applies to all dwellings in addition to BASIX. A Stormwater Management Report has to be submitted with all development applications.

The targets for water quality are clear for Kogarah, while Hurstville has no targets.

Hurstville

Hurstville DCP has some objectives for WSUD in relation to stormwater:

"To encourage an environmentally sustainable regime of stormwater management that achieves a balance between collecting and re-using rainwater, maintaining acceptable environmental flows in streams and allowing for on-site infiltration via landscaping"

This objective is not fulfilled in terms of requirements. The use of rainwater tanks is encouraged, but not mandated. Perforated pavements are suggested, but stipulations around this are unclear. Landscaping is also one of the weakest WSUD controls. The controls on 'other developments' appear weaker even than BASIX for dwellings.

Table 10: Hurstville DCP water management controls

Hurstville								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX	No targets			no dvlpmt size requirements
Flats		Yes	BASIX	Rainwater tanks 'encouraged'				OSD
Other developments								
All			Dual flushing toilets Planting indigenous species	Rainwater tanks 'encouraged' Minimise impervious areas				OSD with pits and grated drains
<1000m^2								
1000m^2 to 2000m^2								
2000m^2 to 4000m^2								
>4000m^2								

.

Kogarah

The Water Management Policy provides detailed information in relation to on-site water management, and in particular stormwater related issues and their interface with the other water cycle and environmental issues. The policy is applicable to all development types requiring Council approval, including in some cases complying development, within the Kogarah LGA. This includes residential, commercial and industrial developments. It is applicable to both private and public land. An online calculator provides an assessment of the development application.

Table 11: Kogarah DCP water management controls

Kogarah								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX + Stormwater Management Report	BASIX + Stormwater Management Report	Targets	Targets imply MUSIC modelling for larger developments	Councils water management policy is based on WSUD	development is ≤50m2 and the total impervious area of the site are >70% Where the proposed development is >50m2
Flats		Yes	BASIX + Stormwater Management Report	BASIX + Stormwater Management Report				
Other developments								
All	No requirements		Stormwater Management report (generated online)	Stormwater Management Report (generated online)	Stormwater Management report (generated online)		Councils water management policy is based on WSUD	
<1000m^2								
1000m^2 to 2000m^2								
2000m^2 to 4000m^2			Integrated approach	Integrated approach	Integrated approach	>3000m^2 or 5 or more pre-dev single allotments		Council's Water Management Policy applies, more detailed analysis and assessment
>4000m^2								

Inner West

Main points:

- **Ashfield DCP controls for water management are amongst the weakest of all those reviewed.**

- **Leichhardt had controls which acknowledge WSUD. The water efficiency requirements for 'other developments' are weaker than Marrickville. The development threshold before "an integrated water plan" is required is the second largest of those DCPs reviewed. This reduces its effectiveness.**

- **Marrickville have stronger DCP controls, but development size requirements seem arbitrary.**

Ashfield

The controls for water management in Ashfield DCP rank amongst the weakest of all those DCPs reviewed. Ashfield requires BASIX and 'encourages', as opposed to requires, developments to go beyond. Multi-unit developments controls mention the need to minimise hard paving – but there are no stipulations. In Ashfield West rainwater reuse is required for 'gardening purposes'.

Council doesn't have any MUSIC licences and in general Ashfield Stormwater Code applies.

The objectives for stormwater drainage are:
a) to provide safety for the public in major storm events, and protect property from damage by flooding;
b) to ensure adequate stormwater detention and run-off controls are provided for site drainage;
c) to improve urban amenity through maintenance of natural drainage lines;
d) to protect and maintain existing infrastructure of the Municipality.

Table 12: Ashfield DCP water management controls

Ashfield								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX	No targets			no dvlpmt size requirements
Flats		Yes	BASIX	BASIX				
Other developments								
All	Advisory requirements only							
<1000m^2								
1000m^2 to 2000m^2								
2000m^2 to 4000m^2								
>4000m^2								

Leichhardt

Leichhardt Council "promotes water sensitive urban design as a means of minimising the impacts on the water cycle and resultant economic, environmental and social consequences". The water quality targets used are the Sydney Metropolitan: Draft Managing Urban Stormwater: Environmental Targets October 2007 (DMUSE). These are similar to the Botany Bay Water Quality Improvement Plan (BBWQIP).

An Integrated Water Cycle Plan is required for all applications which are for:

a. 15 or more dwellings or residential lots; or the provision of accommodation for 50 or more residents, occupants or employees; or
b. The creation of 2,500sqm or greater of impermeable surface; or the subdivision of 2,500sqm or greater of land for commercial or industrial purposes; or
e. Proposals which are expected to generate a water demand of 5,000 litres per day or more

The water efficiency requirements for 'other developments' are less strict than Marrickville. The development size before water planning kicks in are significantly greater.

Table 13: Ashfield DCP water management controls

Leichhardt								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX	BASIX	No targets			
Flats	< 15 dwellings – except for BASIXs	Yes	BASIX	BASIX	DMUSE Targets (same as BBWQIP)	? implied with Integrated Water Cycle Plan	15 or more dwllgs or 50 residents	Integrated Water Cycle Plan
Other developments								
All			3 star taps, 3 star showers, 3 star toilets,	Landscape requirements				
<1000m^2								
1000m^2 to 2000m^2								
2000m^2 to 4000m^2			3 star taps, 3 star showers, 3 star toilets,	????	DMUSE Targets (same as BBWQIP targets)	MUSIC modelling is implied with the Integrated Water Cycle Plan		
>4000m^2								

Marrickville

Marrickville DCP embraces Water Sensitive Urban Design. The DCP is very similar to Strathfield, but has greater strength through smaller floor space requirements for WSUD 'deemed to comply' reports. The many size requirements of developments could be simplified somewhat. However, the simplified requirements for smaller 'other developments' create efficiencies in preparation and assessment.

Marrickville uses the Botany Bay Water Quality Improvement Plan targets The "other developments' floor space size of >100m^2 is at the lower end in comparison to other councils for a water tank with subsequent irrigation/toilet reuse.

Maintenance schedules and costs need to be estimated.

Table 14: Marrickville DCP water management controls

Marrickville								
Development	**No requirements**	**BASIXs**	**Reduce potable water in**	**Retain water for reuse**	**Improve stormwater quality out**	**MUSIC modelling**	**WSUD**	**Other**
Residential		Yes	BASIX		BBWQIP Targets	>2000m^2	>700m^2	"deemed to comply" report btwn 700m^2 and 2000m^2
Flats		Yes	BASIX		BBWQIP Targets	>2000m^2	>700m^2	
Other developments								
All		Not for those developments below 100m^2			BBWQIP targets		10 or more car spaces	
<1000m^2		Yes	Min WELS standard (4 star taps, 3 star showers, 4 star toilets, 3 star urinals	Rainwater tanks, dual reticulation for toilet, laundry, irrigation, cooling towers.		Deemed to comply are tanks & BASIX		>100m^2 and <2000m^2
1000m^2 to 2000m^2					BBWQIP Targets	Yes	>1500m^2 for new Dev. >1000m^2 for adtns to sites >2000m^2	
2000m^2 to 4000m^2								
>4000m^2								

Appendix A: Former Sydney Metropolitan Catchment Management Authority Suggested Stormwater/WSUD LEP Clause[25]

The following Stormwater/WSUD LEP clause could be located in Council's LEP, either in Part 3: Special Provisions or possibly in Part 2: General Restrictions on Development

Planning to protect downstream environments

1. The objective of this clause is to minimise the impacts of urban development on the environmental values of waterways, groundwater systems and bushland areas.

2. For all development in existing or proposed urban areas consent will not be granted for development unless the consent authority is satisfied that:

(a) the stormwater management system includes all reasonable management actions to minimise impacts on, and contribute to the achievement or protection of relevant environmental values;

(b) water sensitive urban design principles are incorporated into the design of the development; and

(c) the stormwater management system complies with council's requirements.

3. For the purposes of Clause 2(b) above, the principles of water sensitive urban design can be summarised as follows:

(a) protection and enhancement of natural water systems (including creeks, rivers, lakes, wetlands, estuaries, lagoons, groundwater systems);

(b) protection and enhancement of water quality, by improving the quality of stormwater runoff from urban catchments;

(c) minimisation of harmful impacts of urban development upon water balance and surface and groundwater flow regimes;

(d) integration of stormwater management systems into the landscape in a manner that provides multiple benefits, including water quality protection, stormwater retention and detention, public open space and recreational and visual amenity; and

(e) reduction in potable water demand by using stormwater as a resource.

[25] Botany Bay Coastal Catchment Initiative "Incorporating Appropriate Stormwater Management/WSUD Requirements in Local Environment Plans (LEPs), June, 2008. The Sydney Metropolitan Catchment Management Authority. http://www.wsud.org/wp-content/uploads/2012/07/Final_Stormwater-_LEP_Advice25June08.pdf Accessed 2 June 2016

Appendix B: Blue Mountains Stormwater LEP Clauses

BLUE MOUNTAINS LOCAL ENVIRONMENTAL PLAN 2015 - REG 6.9

Stormwater management

6.9 Stormwater management

(1) The objective of this clause is to avoid the adverse impacts of urban stormwater on land on which development is located and on adjoining properties, native bushland and receiving waters.

(2) Development consent must not be granted for development unless the consent authority is satisfied that the development:

(a) incorporates best practice water sensitive urban design principles, and

(b) is designed to maximise the use of water permeable surfaces on the land having regard to groundwater levels and the soil characteristics affecting on-site infiltration of water, and

(c) includes, if practicable, on-site stormwater retention for reuse as an alternative supply to mains water, groundwater or river water, and

(d) avoids any adverse impacts caused by stormwater runoff on adjoining properties, native bushland and the receiving natural environment by ensuring that:

(i) the quality of surface water or groundwater leaving the site is not reduced in the short or long term, and

(ii) the quantity and flow characteristics of stormwater leaving the site is not adversely altered, and

(iii) stormwater treatment and disposal methods achieve adequate filtration, absorption, dissipation and scour protection, and

(e) integrates stormwater management measures into the landscape so as to provide a neutral or beneficial effect on environmental and water quality protection, stormwater retention and detention, flood mitigation, landscaping, public open spaces and recreational and visual amenity.

Appendix C: Botany Bay Stormwater and Riparian LEP Clauses[26]

BOTANY BAY LOCAL ENVIRONMENTAL PLAN 2013 - REG 6.3

Stormwater management

6.3 Stormwater management

(1) The objective of this clause is to minimise the impacts of urban stormwater on land to which this clause applies and on adjoining properties, native bushland and receiving waters.

(2) This clause applies to all land in residential, business and industrial zones.

(3) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:

(a) is designed to maximise the use of water permeable surfaces on the land having regard to the soil characteristics affecting on-site infiltration of water, and

(b) includes, if practicable, on-site stormwater retention for use as an alternative supply to mains water, groundwater or river water, and

(c) avoids any significant adverse impacts of stormwater runoff on adjoining properties, native bushland and receiving waters, or if that impact cannot be reasonably avoided, minimises and mitigates the impact.

BOTANY BAY LOCAL ENVIRONMENTAL PLAN 2013 - REG 6.5

Riparian land and watercourses

6.5 Riparian land and watercourses

(1) The objective of this clause is to protect and maintain the following:

(a) water quality within watercourses,

(b) the stability of the bed and banks of watercourses,

(c) aquatic and riparian habitats,

(d) ecological processes within watercourses and riparian areas.

(2) This clause applies to all watercourses and all land that is within 40 metres of the top of the bank of each watercourse.

(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider:

(a) whether or not the development is likely to have any adverse impact on the following:

(i) the water quality and flows within the watercourse,

(ii) aquatic and riparian species, habitats and ecosystems of the watercourse,

(iii) the stability of the bed and banks of the watercourse,

(iv) the free passage of fish and other aquatic organisms within or along the watercourse,

[26] http://www.austlii.edu.au/au/legis/nsw/consol_reg/bblep2013322/s6.5.html accessed 25 May 2016

(v) any future rehabilitation of the watercourse and riparian areas, and

(b) whether or not the development is likely to increase water extraction from the watercourse, and

(c) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:

(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or

(b) if that impact cannot be reasonably avoided-the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised-the development will be managed to mitigate that impact.

Appendix D: DCP Evaluation Method

The following criteria were used to evaluate the relative strength of DCP control provisions:

a. Reducing potable water use[27]

This has been determined by looking at the use of the Water Efficient Labelling scheme (WELs) requirements.

The WELS Scheme is a government-administered consumer advisory scheme that ensures water efficiency information (labelling) is provided for certain water-using products supplied across Australia. Products covered include showers, certain tap equipment, flow controllers, toilets, urinals, dish washing machines and clothes washing machines.

The market research around this scheme suggests water efficiency is the highest or second highest consideration for consumers in their purchasing decisions for products covered under the WELS Scheme. The success of this scheme has been measured by a general shift towards both greater availability and sales of more water efficient products since the introduction of the Scheme.

Sales of WELS 2.5 star rating and below clothes washing machines have contracted substantially since 2007, at the same time as sales of WELS 3 star and above machines have grown. Similarly, in 2007, dish washing machines with a WELS 3 star and below accounted for nearly 90 percent of all sales; however, by 2013 these dishwashing machines accounted for less than 20 per cent of all sales.[28]

b. Keeping water in the landscape

The DCP controls in this area relate to retaining water for re-use by tanks,percentage of roof capture used for tanks, recycling requirements (greywater and irrigation), landscaping and/or porous surface requirements.

In relation to porous surfaces, these controls are difficult to judge. A comprehensive site specific analysis is the best solution. Some soils in Botany and Rockdale, for instance, mean an absorption pit for stormwater should be first priority. In council areas where clay predominates, this is not an option.

Nearly all councils require on site retention devices (OSD). This is the lowest level control in this area, with the only function being the slowing of stormwater release.

c. Stormwater quality

These controls relate to having definite stormwater quality targets and using a site analysis to achieve these targets. The most consistent use of targets (where they are used) are the Botany Bay Water Quality Improvement Plan targets (or equivalent).

The ANZECC guidelines for water quality provide little value. The framework they propose uses three protection levels from high conservation to highly disturbed. The Cooks River is classified as 'highly disturbed'. This is often used as an excuse for allowing a substandard approach to water quality. The water quality in question can be judged to be of higher

---

[27]. This is an artificial distinction because many things may contribute to reducing potable water.

[28] 'Second independent review of the Water Efficiency Labelling and Standards Scheme, Commonwealth of Australia 2015' accessed in April, 2016 at http://www.waterrating.gov.au/resource/second-independent-review-wels-scheme

quality than the receiving environment (eg. the Cooks River)[29]. This means that whatever is put into the river should be slightly better than the readings taken from the river at any convenient time. No allowance is made for the cumulative effect, or the effort to make the Cooks River a 'swimmable environment'.

d. MUSIC Modelling (or equivalent)

Superior controls require this kind of modelling because it allows for a site specific analysis. **Targets** used for this model are the Botany Bay Water Quality Improvement Plan targets (or the equivalent). The better DCPs use this modelling for larger developments and provide detail for smaller developments to achieve the same level of outcomes.

One DCP (Kogarah) provided additional assistance for small developers, and assessing planners, through an online tool producing a report that was required to accompany the development application.

e. Water Sensitive Urban Design (WSUD)

All DCPs have objectives that they are trying to achieve. The express use of WSUD objectives means a focus on all the elements above. Lesser DCPs had primary objectives related only to drainage.

f. Development Size

Stronger DCPs in relation to sustainable urban water management applied controls to all developments, regardless of size (Botany Bay Council). Lesser DCPs created controls only for the very largest developments.

The Housing Industry Association gives the average size of a new detached house in 2014 as 252m^2, and a dwelling as 128m^2.[30] A development of 1000m^2 is the equivalent of approx. 4 houses or 8 dwellings.

[29] Roads and Maritime Services "WestConnex New M5 Environmental Impact Statement"

[30] https://hia.com.au/~/media/HIA%20Website/Files/IndustryBusiness/Economic/fact%20sheet/3494_HIA2015_IndustryFactSheet_161115.ashx accessed 18/6/2016