Water Reuse & Sustainable Surface Water Management Technical Committee

Strategy 2015/16

- Nottingham rain garden

Committee Membership

Name	Affiliation
Sue Charlesworth (Chair)	**Coventry University**
Kevin Reed (Co-Chair)	**Graf UK**
Doug Clarke	**Severn Trent**
Phil Mills	**Policy Consulting UK (special guest)**
Terry Nash	**UK Rainwater Management Association**
Colin Booth	**University of West of England**
Kimberly Bryan	**University of Exeter**
Peter King	**Ouse & Adur Rivers Trust**
Andy Wilson	**Scottish Water**
Suzy Armsden	**WATEF Administrator**
David Knaggs	**Albion Water**
Katherine Hyde	**University of Reading**
Lutz Johnen	**Aquality**
Alan Fewkes	**Nottingham Trent University**
Daniel Goodwin	**Cranfield University**
Angela Wallis	**Environment Agency**
Sarah Mukherjee	**Water UK**
Phil Barnard	**Chandlers**
Carmen Snowdon	**WRc PLC**
Neil Pendle	**Waterscan**
Aaron Burton	**Foster Wheeler AMEC**
Kemi Adeyeye	**WATEF Network Lead**
Phil Henry	**Polypipe**
Kiran Tota-Maharaj	**University of Greenwich**

Background

Flooding and water resource management are global issues, exacerbated by climate change, rapid population expansion and associated urbanisation. Traditional responses to flooding, such as barriers, large pipes and conventional, hard drainage do not work, and in fact, lead to more intense flooding with associated risk to life, livelihoods and degraded environments. Meanwhile, water is being wasted, directed to the storm sewer where it intensifies problems downstream, adding to costs at the Waste Water Treatment Works (WWTW) and potentially pollutes the receiving environment.

A sustainable approach to the management of excess surface water, or SuDS (Sustainable Drainage Systems) mimics nature, allowing water to infiltrate, be detained and then be slowly conveyed to the receiving watercourse. During this process, water velocity and volume are reduced and the water quality improved. Devices incorporating blue and green infrastructure such as ponds, wetlands, green walls and roofs, swales and filter strips provide amenity, with the potential for recreational activities and aesthetically pleasing living spaces as well as increased opportunity for wildlife and natural planting. Not confined to the urban area, there is an increased interest in Natural Flood Resilience Measures in rural areas, utilising farmland to store water and release it slowly using riparian planting, coppices of trees, large woody debris dams and reinstatement of farm ponds.

As part of this approach, hard infrastructure such as pervious paving (PPS) stores, treats and conveys stormwater, but also provides a hard running surface in lightly trafficked areas as well as pedestrian pavements and car parking. Rainwater harvesting and greywater reuse are important components of sustainable water resource management, and also have a role in reducing water volumes in terms of flood alleviation, and to be treated at the WWTW, providing uses for water which would otherwise be wasted.

However, much of this approach has to be embedded in engagement with the community, without whose inclusion in decision-making and consultation such interventions would either fail to be implemented at all, or would not be accepted and would therefore become unsustainable.

The focus of this Technical Committee is therefore broad, encompassing the hard, physical sciences such as water pollution, soil infiltration capacity and structural strength of PPS, but also including the underpinning social sciences such as public perceptions, user interfaces and monitoring of amenity use.

This Strategy provides a brief review of the activities of the Water Reuse and Sustainable Surface Water Management Technical Committee in 2014/15 and outlines proposed activities and a timeline for 2015/16.

Review of 2014/15

Key outcomes:

- Amalgamation of the Sustainable Surface Water Management (SSWM) and Water Reuse (WR) Technical Committees in August 2015

Key activities undertaken by the Technical Committee in 2014/15:

- Presentations at the Water Efficiency Conference, Exeter University, Exeter, UK. August 6-7, 2015:
  SSWM: Charlesworth, S., T. Nash, C. Booth, P. King, K. Bryan, A. Crilly, A. Burton, D. Knaggs, C. Snowdon (2015) Surface water management issues survey.
  WR: Barnard, P., K. Reed (2015) A view on the current state of the art in water reuse technologies
- Meetings of **SSWM** were held at Coventry University on 5 February 2014, Ricardo AEA offices in London on 17 April 2014.
- Meetings of **WR** were held by teleconference on 6th August 2014, at Chandlers on 28 August 2015, at Banbury on 10th October 2015, by teleconference on 3rd December 2014, and at Brighton University on April 1 2015.
- Meetings of **WR&SSWM** were held on 5 August 2015 (Exeter University – inaugural meeting), and on 11 November 2015, Severn Trent Water, Coventry.
- Engagement by the TCs with the conference to be held at Coventry in September 2016
- **WR** visited the Old Ford treatment plant on 22 Jan 2015 to see the recycling of black water used to irrigate Olympic park

Work plan 2015/16

Our TC is a relatively young, reasonably large group covering academics, stakeholders and practitioners, so we have a wide field of interests leading to many opportunities to work together. The following are ideas generated at our first meeting as a TC, they are not in any order of importance, but are areas which merit attention, and which we plan to address during 2016.

1. Education and information

This is an issue for both SuDS and greywater reuse (GWR) in that cross connections of GWR with other systems still happen. Installers, consultants and designers need to know what should be there, and what should not, when installing systems. When SuDS is installed it requires knowledge of how it is supposed to work – allowing infiltration and/or storage and conveyance – we should focus on the *reduction* of water to the drainage network – not simply delaying its arrival. Promotion of infiltration or reuse as first option. In a specific example of where education is needed urgently, in a survey of developers, it was found that most thought mains water should be used to flush WCs rather than GWR or RWH, this shows the lack of understanding of the relative safety, and sustainability of using harvested or reused water rather than potable. Probably also associated with lack of education of these systems is the fear over perceived lack of robustness of systems, in particular greywater (GWR) systems where people have most fear in terms of treatment of water and quality. This also applies to RWH to a lesser extent. When making the decision to install GWR, RWH or SuDS into and around domestic properties, and during their construction, there needs to be information made available on their benefits and payback.

2. Deregulation

Retail competition in 2017 may mean that water companies are working with other larger customers. In Scotland what they have found is that the focus moves from encouraging water efficiency to retention of customers. Water companies will no longer have influence with the customer making it very difficult to encourage water efficiency. If the water company does not have a direct relationship with the customer they cannot exercise any influence over the customer only via a third party. The retailer is only interested in retaining the customer and making money. What is required is for evidence to be pulled together that water reuse systems can work and water quality is not compromised. Only when this evidence is available is it possible to engage and educate.

3. Research

We intend identifying suitable case studies which we can have input into. Two already identified include:

a. Upper Rissington – Stow-on-the Wold – Albion Water
https://www.albionwater.co.uk/developers/our-projects/upper-rissington-gloucestershire
Albion are making progress but there is still a lot of work to be done in terms of urban data sets, with the main area of concern being cross connections and impacts on water quality. Smart metering identifies where cross connections may occur into the potable water supply, but Albion are keen to produce more evidence; the data may be available next year – David Knaggs invited the TC to a site visit. It would be good to get universities on board to collect and analyse data,

and whilst Albion currently has a relationship with Cranfield, they are keen to work with Coventry and Reading Universities.

b. Bicester Eco Town where 90 RWH systems installed and Graf UK are working with Willmot Dixon, Thames Water, and A2 Dominion Housing Association.

We have academic members in the Technical Committee who can perhaps help on the following ideas:

• Need for evidence to be pulled together and identify current projects and examples we can use to enable us to dispel public concerns.

• Look at measuring flow of water and relate to energy usage

• Coordinate and push forward research that would be useful for organisations such as manufacturers of equipment, DEFRA, EA (for future regulations); water companies, local authorities (to assist with their planning);

• Provide evidence that the technology works to enable retailers to sell water efficiency measures post deregulation

4. Barriers and Drivers

We need to look at their features and assess benefits; for example, the impetus in the Cotswold development (at Upper Rissington) was water infrastructure and capacity requirements. Location is also a driver, associated with the cost to install it into a home and whether there was a water source in the vicinity. In the case of SuDS there are concerns over who is responsible for on-going maintenance costs, whether it is the householder, the developer, the local authority, and also that only above ground schemes would be adopted by local authorities and Scottish Water. Recently Graf installed an attenuation tank in Aberdeen – the system is to be adopted by Aberdeen City Council once the development is complete. They will then be responsible for ongoing maintenance - Scottish Water insisted on the system having integral access for camera and jetting equipment to ensure ease of future maintenance. Fairhurst are the consulting engineers and whereas two years ago there was a reluctance to include these systems in any developments – they are now happy to incorporate in any future schemes. The advantage of this type of system is that the tank can be used for both attenuation and storage of water for reuse. However, if the regulations aren't in place, then ultimately you may not get people to use water efficient measures until they are robust enough. In terms of price: the public want lower water bills, although in general water bills are going down rather than up. It may be worth an examination of the non-domestic market first of all –if the commercial side accepts the technology, a cascade may happen.

5. Possibility of an academic paper

A new initiative has been announced by the journal *Building & Environment* (impact factor 3.341) of a "Ten questions" paper series which should deal with a well-defined topic and should be centred on a selection of ten relevant and topical questions. Submissions are based on invitation only by the Editor of the Special Initiative (SI). Papers will be recruited in a way that ensures balanced coverage of all topics in the scope of *Building & Environment*. The papers should be (co-)authored by established researchers in the field with proven expertise on the topic, typically by an extensive track record of previously published books and/or peer-reviewed journal papers. The questions are selected and answered by the author(s). The questions should be such that the paper is visionary, authoritative and can provide younger researchers directions for future research. *Building & Environment* intends to

publish annually at least 12 papers in this series, where this paper will be published as the first paper in every volume. Depending on the number of accepted "Ten Questions" papers, the publication scheme can be adjusted to include more or less of these papers in a volume.

The submission and review procedure is a two-step review process whereby invited authors submit the following components of the intended paper to the Editor of the SI:

- title
- abstract (max. 250 words)
- keywords
- tentative list of ten questions
- one-sentence answers to the questions
- description of expertise of the authors on the topic (max. 250 words)
- list of five suggested reviewers (name, title, affiliation, email address, reason for selection)
- intended submission date of full paper

We will put 10 questions together on water reuse and sustainable surface water management with the focus on the 2016 WATEF conference and submission of the full paper to *Building & Environment* by the end of the year.