Bioaction
sustainable environmental solutions

SPRING 2010

NEWSLETTER

Each and every point of retention and treatment has a positive outcome to our waterways

STORMWATER - it's all our responsibility

We let it go down the drain and it pollutes our waterways - WHY?

Australians live in the driest inhabited continent. Managing scarce water resources requires a complete water cycle approach to protecting the country's unique ecosystems. The variability of rainfall and runoff is more extreme than other parts of the world. Australians have made a large investment in stored water capacity to supply rural and urban users in this climate. Every year we all watch in amazement as stormwater pours down our drains, little stormwater is captured, with most adding to the pollution of waterways.

Urban stormwater is defined as runoff from urban areas, including the major flows during and following rain, as well as dry-weather flows. Many factors influence the amount of stormwater and the contaminants that are transported by it, including:

- Duration and intensity of rainfall.
- Proportion of impervious surfaces.
- Shape of the land.
- Land use.
- Design and management of stormwater systems.

In addition to washing contaminants from the atmosphere, rainfall in the form of stormwater runoff flushes material accumulated on surfaces including litter, dust and soil, fertilisers and other nutrients, chemicals and pesticides, micro-organisms, metals, oils and grease into waterways.

Overall, about 12% of Australia's rainfall finds its way into surface streams. By contrast, in highly urbanised zones up to 90% of the rainfall may flow into the stormwater system.

In the past, the prime objective of urban stormwater management has been flood mitigation. The aim has been to channel the stormwater as rapidly and invisibly as possible from within our urban areas to the nearest waterway, usually on the coast.

The necessity to deal with both the quantity and quality of runoff is now recognised. The 'hard' engineering strategy for the management of stormwater is being modified by an increase in the application of Water Sensitive Urban Design (WSUD). This strategy focuses on the sources of runoff and pollution and the tools to contain and reuse the water within urban housing, commercial and industrial areas.

http://www.environment.gov.au/coasts/publications/stormwater/index.html

Stormwater Pollutants	Source	Impact
SEDIMENTS	Erosion Construction Road & Footpath wear	Smother ecosystems Block sunlight Impact aquatic life
HEAVY METALS	Vehicle emissions & wear Atmospheric deposition Industrial discharge	Toxic to aquatic life & organisms Bioaccumulation in the food chain
NUTRIENTS	Chemicals Organic matter Soluble fertiliser	Algal bloom Encourage exotic plants Increase BOD's Eutrophication potential
PATHOGENS	Animal faeces Sewerage leakage	Human & ecological disease Recreational impact
HYDROCARBONS	Vehicle emissions & wear Spills Illegal discharge	Aquatic toxicity Native animal impact

Filter Swales or Rain Gardens improve our environment

Not only do filter swales provide an effective and effecient way in which to treat stormwater, they also improve the appearance of hard landscaping in urban development.

They provide habitat for native animals by buffering the ecological impact of urbanisation. This picture shows a well designed filter swale treating water from a sealed car parking area.

Photo courtesy of: Alan Hoban - Program Manager: Water By Design

New Product
Just arrived! Coir Net in compressed bales which dramatically reduces the cost of handling with 200m2 in each bale.

Landscape Expo Sydney 2010
Thanks to everyone who visited our stand during the show. It was great to meet with industry professionals.

What's new!

Coir Net Geonettig - NOW IN COMPRESSED BALES

Stock has just arrived of 400gsm Coir Net in compressed bales. Each bale has 200m2 of net (5 each 20 x 2m rolls). This dramatically reduces logistic and handling costs.




The images above show how the net can be easily handled which will have significant cost savings during installations.

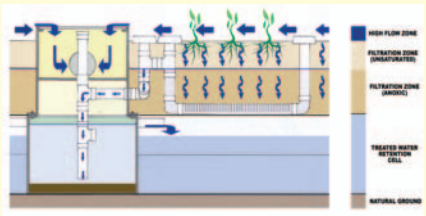
Packaged Stormwater Biofiltration System developed

Bioaction has been involved in the construction of odour biofiltration for many years and has responsible for advancing the technology to expand its application into many new industrial applications as well as sewerage treatment.

Through that technology it has developed packaged storm water filtration systems using renewable filtration media and bioengineered systems.

The use of biofilters (bioretention systems and rain gardens) plays a significant role improving storm water and wastewater quality by removing nutrients and contaminates. The system can remove nutrients, heavy metals, suspended solids, and hydrocarbons through a physical and biological process enhanced by the phytoremediation function of plants.

The systems conforms to the FAWB Stormwater Biofiltration Systems Guidelines and its application forms a part the Water Sensitive Urban Design (WSUD) elements.



The design above incorporates a harvesting detention subsurface tank in the same construction.

State Planning Policy for Healthy Waters

The State Planning Policy for Healthy Waters was released by The Honourable Kate Jones, Minister for Climate Change and Sustainability at the launch of the 2010 Ecosystem Health Report Card on the 20th October.

Taking effect on 28 February 2011, this SPP is designed to protect environmental values of waterways by ensuring urban development manages stormwater and wastewater.

The key issues addressed by the policy are stormwater quality, the stability of waterways, managing frequent flows and designing and managing artificial urban lakes.

Water by Design prepared the business case that supported the policy. The business case documents the likely costs and benefits of using water sensitive urban design practices to meet the design objectives contained in the SPP.

HEALTHY WATERWAYS
Because we're all in the same boat

Water by Design publicly released *Business Case for Best Practice Urban Stormwater Management (Version 1.1)* on its website and it is available:

http://waterbydesign.com.au/businesscase/

Murdoch odour trials prove the performance of the Bioaction FiltaOdour system

The Environmental Biotechnology Cooperative Research Centre (EBCRC) in conjunction with Murdoch University initiated extensive research in odour management utilising fixed bed biofiltration. Odour is a major problem faced by many industries including livestock, poultry, bioprocessing and secondary waste processing. Biofilters are effective in removing odours, but filters deteriorate, necessitating over-design and regular replacement.

From successful lab results field-testing was established at the Southern Regional Metropolitan Council's (SMRC) Regional Resource Recovery Centre (RRRC).

The Waste Composting Facility (WCF) of the RRRC processes over 80,000 tonnes of household waste from the green-topped bins per annum, which is converted to compost.

At each stage of the handling and processing odour is ventilated from the enclosed buildings through a series of biofilters to abate the odour. There are four biofilters that are traditional "in-bed" designed system using bark as the filter media. The SMRC have not been satisfied with the levels of odour reduction and the impact on nearby residents.

Four pilot-scale biofilters with different media profiles using blends of organic/ mineral blends were located at the corner of existing aeration floor biofilter (Figure 1).

Two methods of evaluation were employed;

1. Sensory concentration measurements were taken from the inlet and outlet of the test biofilters using olfactometer to determine the change of odour strength. Olfactometry AS/NZS4323.3: 2001.

Inlet concentration OU - 10,090
Outlet Concentration OU - 69
Odour reduction - 99.3%

2. Analytical measurement using gas chromatography-mass spectrometry (GCMS) to determine the removal of specific volatile compounds in the air stream.

Based on results it is clear that pilot-scale biofilters were able to significantly remove these compounds from the feed gas.

For further information go to:
www.bioaction.com.au

Figure 1 - Pilot test biofilters were placed at the inflow manifold feeding the primary biofilter at the RRRC