

Stormwater Facts

No.3



Auckland
Regional Council
TE RAUHITANGA TAIAO

Stormwater quality effects

Impervious surfaces collect contaminants such as litter, dust, decomposing vegetation, sediment and oils. Stormwater then washes these contaminants into our drains, streams and ultimately the sea. An increase in stormwater runoff can lead to a deterioration in the water quality of our receiving environments.



Swales provide water quality treatment

Contaminants in stormwater can act in many different ways to cause adverse effects on biota in our streams, estuaries and the sea. Sediments reduce light transmission through the water, clog fish gills, affect filter feeding shellfish, smother organisms, change habitats and fill up estuaries. Elevated levels of metals in stormwater can collect in filter feeding shellfish where they may threaten public health. Metals also affect the food chain by reducing the number and diversity of marine animals in our estuaries and harbours.

In the Auckland Region estuaries act as the main retention zones where stormwater contaminants are deposited. This accumulation of contaminants in the estuaries are of concern because of their ecological importance.

Sediment, zinc and hydrocarbons are key contaminants in the Auckland Region. Zinc primarily comes from galvanised roofs and car tyres.

Water quality treatment

Treatment of water quality is a two-phased process:

- identify the contaminants of concern, and
- choose a relevant stormwater treatment.

1) Contaminants of concern include:

Suspended sediments, metals, organic matter and detritus, pathogens, hydrocarbons and oils, toxic trace organics (eg polyaromatic hydrocarbons – PAHs), nutrients and litter. Primary sources of contaminants include sediment, zinc and hydrocarbons from cars, car tyres, and galvanised roofs.

2) Stormwater treatment practices

Stormwater treatment practices often rely on contaminants becoming attached to suspended solids (suspended solids are 125µm particles or smaller). The contaminants can then be treated by:

- a) settlement of contaminants or,
- b) filtering of contaminants by the passage of stormwater through a filter media or into the ground, or
- c) flotation (for oil and litter).

The removal of dissolved contaminants is administered through contact with organic matter.

Devices that can be used to treat water quality include stormwater ponds or wetlands, rain gardens or sand filters, swales or vegetative filter strips, API separators, rain tanks or green roofs. See Technical Publication 10, May 2003: *Stormwater Management Devices: Design Guidelines Manual* (TP10) for choosing and designing constructed water quality treatment devices.

Different treatment devices have different potential for removing contaminants. For example, wetlands are good at removing all types of contaminants, whereas sandfilters have a high potential to remove suspended solids, metals and hydrocarbons. Constraints for stormwater treatment devices include catchment area, soil type and slope.

Source Control

Source control of stormwater contaminants is important. This involves specific pro-active measures to prevent rain entraining potential sources of contaminants and carrying them into the stormwater network (eg, use of rain tanks for water re-use, painting of galvanised roofs etc).

Standards of water quality treatment for the Auckland Region

In general, all developments which require a stormwater consent from the ARC must provide stormwater quality treatment which achieves a 75% reduction in suspended solids leaving the site on a long term average basis.

The ARC advocates using a "treatment train" approach to stormwater management providing a suite of stormwater practices for treatment and quantity control on a site.

Further information

Further information about stormwater quality and stormwater treatment devices can be found in TP10 which is available on the ARC website: <http://www.arc.govt.nz>

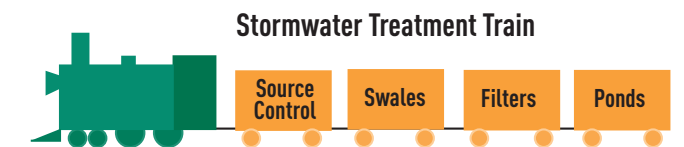
Other stormwater fact sheets are also available on the ARC website. Alternatively, you can contact ENVIROLINE on (09) 366 2000 for more information regarding stormwater consents.



Rain gardens also provide stormwater treatment to TP10 standards



Catchpits drain stormwater to piped systems which discharge to our streams and coast.



TP10 recommends using a "Treatment Train" approach to stormwater management

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