

Reduced maintenance costs through innovative design

Stormwater360 is New Zealand's only specialist stormwater treatment company and have a range of products to treat the various stormwater contaminants from gross pollutants through to dissolved metals.

Stormwater360's flagship technology is the StormFilter. Approved in 2003 by the ARC for TSS removal and in 2004 for heavy traffic loading (with the associated dissolved heavy metals). StormFilter is New Zealand's most used treatment device with more than 400 units in the ground; a large number of these belonging to territorial authorities.

The StormFilter is a cartridge-based media filtration system using siphonic radial filters with a self-cleaning function. The siphon action allows the StormFilter to use a filter bed with a high surface area and a small footprint. StormFilter's large surface area ensures longer maintenance frequencies, as the surface area of any filter has a direct correlation to maintenance frequency. Through scheduled maintenance and routine inspections of installed StormFilters, Stormwater360 is finding that the period between maintenance frequencies is longer than expected once site construction activities have ceased. The following three case studies demonstrate the extended maintenance periods.

Study 1 – Lincoln Park 38 cartridge StormFilter

One of the first StormFilters to be vested to a city council is the 38-cartridge StormFilter at Lincoln Park subdivision (Carmel place), Waitakere City, Auckland. Treating 3.5 hectare (50 lots) of mixed residential, the system was designed for a 12 month maintenance frequency. Subsequent to the initial construction phase of the site, the StormFilter is now lasting more than 18 months between maintenance intervals.

Study 2 – Albany Bus Station

New Zealand's largest StormFilter is installed at Albany Bus Station on North



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Shore's Northern Busway. The 148-cartridge system was constructed for Transit as part of the busway project and has now been vested to North Shore City. Albany Busway (along with all of the other Northern Busway StormFilter systems) uses a mix of zeolite, perlite and granular activated carbon (ZPG) filter media, due to the requirement for removal of dissolved metals from the highly trafficked sites. Albany Busway was designed as a 'treatment-train' using Enviropod catchpit filters in the carpark and roadway catchpits as pre-treatment to reduce loading on the StormFilter. A small polishing wetland was also located after the StormFilter. The StormFilter is now estimated to last 24 months between cleans, doubling the 12-month frequency originally anticipated.

Study 3 – Huia Lane Subdivision

In Rodney District, a 38-cartridge StormFilter downstream of a detention tank was recently maintained with positive results. The 20-lot residential subdivision has the majority of houses completed and observation of the cartridges during the recent maintenance clean indicate that once the development is complete, the StormFilter should last 24 months or longer between cleans. This longer maintenance frequency may result in maintenance cost as low as \$100 per lot per year for the StormFilter.

Mike Hannah, Technical Director, Stormwater360 says: "We appear to be the only supplier that calculates maintenance during the design phase of our systems. We have done a lot of



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- 1. In-field flow test checking 'design flow rate'
- 2. Lincoln park grated StormFilter vault
- 3. Albany busway StormFilter
- 4. Gravel and debris from construction runoff
- 5. Huia Lane maintenance clean

work in the lab working out exactly how much sediment (contaminants) a cartridge can hold. When we design a system we estimate the quantity of sediment a given site will derive. Post-installation we have a programme for follow-up monitoring to see how they are actually performing in the field – this is the only real way to check the theory against reality.

"We are really pleased to see our estimates are conservative and the filters are generally lasting 50 per cent to 100 per cent longer than anticipated. This means a lower maintenance cost which makes everybody happy.

"We are finding that systems work hard during the site's construction phase, which can often last more than two years after installation. Once the contaminate loads stabilise, the systems

are performing better than anticipated." Auckland Regional Council (ARC) and Koru Environmental Consultants Ltd. have been developing a life-cycle costing model for stormwater treatment devices in the Auckland Region. "We work closely with the ARC and their consultants supplying monitoring data and actual maintenance costs from installations over the last four years. It is my understanding that research to date suggests the StormFilter lifecycle costs are comparable if not less than traditional forms of treatment and low impact design".



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