

Case Study

Vegetated Biofiltration System Long Beach, California

BACKGROUND

The Centre for Organic Research & Education (CORE) collaborated on research on a Bioswale system located in an industrial area in Long Beach, California and was constructed in 2012. The system collects contaminated parking lots runoff and removes pollutants such as heavy metals, hydrocarbons, TSS and Volatile Organic Compounds to provide safe discharge of stormwater to the environment.

This vegetated biofiltration system also reduces nuisance flooding and heat island effect while presenting an aesthetically pleasing streetscape.



PROJECT

The bioswale installation incorporates the extensive use of Advanced Bio-filtration Media – a customized bio-filter technology that enables the widespread capture, treatment and re-use of contaminated run-off by optimizing the treatment process based on filter component selection.

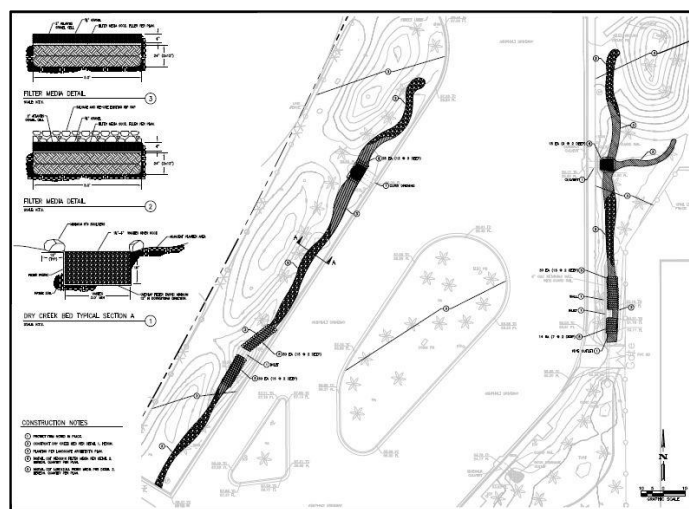
CORE conducted research with local members and developed media formulations that are customized to suit the specific soil, pollutant

concentrations and hydraulic flow requirements of the particular site.

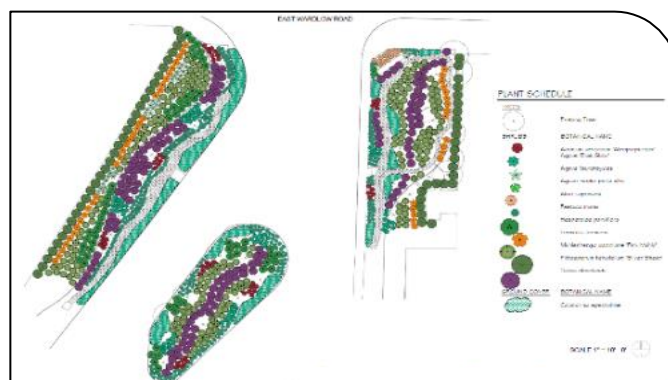
The Advanced Biofiltration Media is engineered to capture, degrade or remediate toxic chemicals that are the result of daily urban and industrial activities. Through this process, toxic chemicals are transformed into natural and nontoxic elements or encapsulated within the system.

DESIGN

(a) Schematic diagram for the bioswale system



(b) Planting design for the project



Three bioswales were located on the site. The vegetation integrity aspects of the Advanced Biofiltration Media in the Bioswales were well exhibited with the establishment of healthy plants.



Bioswale construction and establishment.

TEST DATA

The Table below summarises baseline pollutant concentrations results for stormwater effluent quality from the bioswale during continuous monitoring activities from December, 2012 (pre-installation) to April, 2013 (post-installation).

Purgeable Organics (VOCs) dropped dramatically from 394.5µg/L to ND (Not detected).

Concentrations of some heavy metals, like Zinc and Chromium, were significantly decreased to nearly half of the original level. Additionally, the concentration of TSS and COD were mitigated to acceptable levels. The monitoring results proved superior pollutant removal performance of Advanced Biofiltration Media in a vegetated bioswale system on an industrial site.



Vegetation establishment

Table 1 Bioswale effluent quality monitoring results

Pollutant	Baseline concentration	Sampled Feb 5 th 2013	Sampled Mar 13 th 2013	Sampled April 25 th 2013
pH	7.97	7.81	7.85	7.77
TSS (mg/l)	74.2	7.3	12	14.2
COD (mg/l)	180	125	94.5	107
Chromium (mg/l)	0.70	0.32	0.50	0.39
Zinc (mg/l)	0.28	0.10	0.05	0.06
VOC's*	394.5	Not detected	Not detected	Not detected

*Bromoform- 20.5

*Chloroform 374