12.0 New Technologies

Advancements in the science of storm water management have lead to the development of several proprietary products that may prove useful for controlling urban runoff in the Lake Tahoe Basin.

Reference to specific product manufacturers does not constitute an endorsement. Any criticism or support is neither implied nor intended.

12.1 StormFilter

Description: StormFilter is a passive, flow-through storm water filtration system. It consists of rechargeable media cartridges housed in a concrete vault. The vault is composed of three bays: a pretreatment bay, a filter bay, and an outlet bay. Heavy solids are removed at the pretreatment bay. Flow then passes through the media filled cartridges that trap particulates and adsorb dissolved materials such as metals, hydrocarbons, and orthophosphate. Treated water empties into an underdrain manifold that discharges to the outlet bay.

Application: The StormFilter is a self contained, underground vault system appropriate for treating runoff from parking lots, industrial sites, and roadways. The design is well suited for areas where space is limited and treatment needs are high.

Advantages:

- Various media – Seven different types of media are available for the filter cartridges. Of particular interest is an iron infused media capable of removing dissolved phosphorus. Pleated fabric and perlite are reportedly effective for removing fine sediments. Other media are well suited for removing hydrocarbons and soluble metals.
- Flexible configurations – StormFilters are available as pre-cast vaults, cast-in-place units, and pre-cast filters designed to be installed in storm drain drop inlets. Cast-in-place units can be quite large, involving over 100 individual filter cartridges. Drop inlet units are designed to handle small flows at individual locations with one cartridge per unit.
- High pollutant removal capacity – StormFilter media cartridges appear to be effective for removing dissolved pollutants and fine sediments. Independent studies suggest high dissolved phosphorus removal rates associated with the iron infused media.
- Pretreatment may be required to remove coarse sediment to prevent clogging of cartridges.

Disadvantages:

- Yearly maintenance may be time consuming and expensive. Each cartridge weighs roughly 150 pounds and must be replaced at least once per year.
- Smaller StormFilters (such as the drop inlet units) may not be capable of filtering high flows.
- Caltrans reports unfavorable performance in Southern California. Contact Kenneth Smarckel, Caltrans, for more information.

Other:

Stormwater Management Inc. also manufactures the StormGate high-flow bypass installed as a complete manhole unit

that can be used with a variety of storm water BMPs. Higher flows from more intense storms are restricted by a low-flow orifice and directed over an adjustable weir, bypassing water quality facilities and preventing the resuspension of sediments. Such a bypass may prove useful for separating first flush runoff from storms with higher flows.

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12.2 StormTreat System

Description: The StormTreat System (STS) consists of a series of sedimentation chambers and constructed wetlands. The wetlands are contained within a modular 2.9 meter diameter recycled polyethylene tank. Influent is piped into sedimentation chambers where pollutants are removed through sedimentation and filtration. Storm water is then conveyed from the chambers to the surrounding wetland. The STS conveys flows directly to the subsurface of the wetland and through the root zone for improved filtration, adsorption, and biological uptake and conversion. (EPA Fact Sheet 832-F-99-044)

Applicability: The STS is adaptable to a wide range of site conditions and watershed sides. Designers of the system claim that it can be used to treat runoff from highways, parking lots, and commercial, industrial, and residential areas. The system is designed as an offline system to treat first flush flows. The manufacturer recommends 1-2 units for each acre of impervious surface.

Advantages:

- Manufacturer reports high removal rates for hydrocarbons, total phosphorus, metals, and suspended sediment.
- Relatively large holding volume of 1,390 gallons. Manipulating an outlet control valve can vary flow rates and holding times.
- Low maintenance. Annual or more frequent inspections and replacement of influent line sediment control sacks. Sediment must be removed from the main chamber every three to five years. Plants and gravel will need to be replaced every 10-15 years (estimate).
- Adaptable to different soil types and groundwater conditions.

Disadvantages:

- The STS is relatively new has had limited testing in cold, snowy climates.
- Wetland efficiency may be limited during the winter season when vegetation is dormant.

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12.3 Fossil Filter

Description: The Fossil Filters is an adaptable device designed for storm water drop inlets. The design includes a trough-shaped tray that directs flow through an activated alumina media with a high flow bypass incorporated in the center of the tray.

Application: Like all drop inlet inserts, Fossil Filters are well suited for treating runoff from small impervious surfaces. While they can be used for road and highway treatment, maintenance demands are high.

Advantages:

- Adapts to any size or shape inlet, allowing for easy retrofit.
- Uses an approved inert filter absorbent.
- Absorbent is non-leaching, allowing for easy disposal.

Disadvantages:

- May have limited highway application because of clogging.
- Does not work in areas where storm water is not channeled.
- Primarily targets petroleum hydrocarbons and sediment – product is not intended for nutrient removal.

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12.4 Ultra-Urban Filter

Description: The Ultra-Urban Filter is another drop inlet insert primarily designed for the removal of oil and grease. Similar to other designs, the Ultra-Urban filter is a rigid plastic tray filled with an absorbent "Soft Sponge" filtration media. A screen is included to help remove trash and other debris.

Applicability: Well suited for treating runoff from small impervious areas such as parking lots. While Ultra-Urban Filters can be used for road and highway runoff, maintenance requirements are high.

Advantages:

- Adaptable to most existing drop inlets
- Effective for oil and grease removal

Disadvantages:

- May have limited highway application because of clogging.
- Does not work in areas where storm water is not channeled.
- Targets heavy sediments, oil, and grease. Ineffective for nutrient removal.

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12.5 SIFT Filter

Description: The SIFT filter is another drop inlet insert device designed to be inserted into storm water inlets to remove sediment, debris, and hydrocarbons from incoming flows.

Applicability: Like other drop inlet inserts, the SIFT filter is well suited for treating runoff from small impervious surfaces. While they can be used for road and highway treatment, maintenance demands are high.

Advantages:

- Easy to install and maintain.
- Adaptable to most existing drop inlets.
- Designed to accommodate high flows.
- Filter medium is manufactured of non-hazardous absorbent material.

Disadvantages:

- May have limited highway application due to high maintenance demands.
- Targets heavy sediments, oil, and grease. Ineffective for nutrient removal.

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