



## General Description

Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of stormwater runoff. Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems. Therefore, swales are best suited for residential, industrial, and commercial areas with low flow and smaller populations.

## Inspection/Maintenance Considerations

It is important to consider that a thick vegetative cover is needed for vegetated swales to function properly. Usually, swales require little more than normal landscape maintenance activities such as irrigation and mowing to maintain pollutant removal efficiency. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g., debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained. The application of fertilizers and pesticides should be minimized.

## Maintenance Concerns, Objectives, and Goals

- Channelization
- Vegetation/Landscape Maintenance
- Vector Control
- Aesthetics
- Hydraulic and Removal Efficacy

## Targeted Constituents

✓ Sediment	▲
✓ Nutrients	●
✓ Trash	●
✓ Metals	▲
✓ Bacteria	●
✓ Oil and Grease	▲
✓ Organics	▲

### Legend (Removal Effectiveness)

- Low
- High
- ▲ Medium



Inspection Activities	Suggested Frequency
<ul style="list-style-type: none"> <li>■ Inspect after seeding and after first major storms for any damages.</li> </ul>	Post construction
<ul style="list-style-type: none"> <li>■ Inspect for signs of erosion, damage to vegetation, channelization of flow, debris and litter, and areas of sediment accumulation. Perform inspections at the beginning and end of the wet season. Additional inspections after periods of heavy runoff are desirable.</li> </ul>	Semi-annual
<ul style="list-style-type: none"> <li>■ Inspect level spreader for clogging, grass along side slopes for erosion and formation of rills or gullies, and sand/soil bed for erosion problems.</li> </ul>	Annual
Maintenance Activities	Suggested Frequency
<ul style="list-style-type: none"> <li>■ Mow grass to maintain a height of 3–4 inches, for safety, aesthetic, or other purposes. Litter should always be removed prior to mowing. Clippings should be composted.</li> <li>■ Irrigate swale during dry season (April through October) or when necessary to maintain the vegetation.</li> <li>■ Provide weed control, if necessary to control invasive species.</li> </ul>	As needed (frequent, seasonally)
<ul style="list-style-type: none"> <li>■ Remove litter, branches, rocks blockages, and other debris and dispose of properly.</li> <li>■ Maintain inlet flow spreader (if applicable).</li> <li>■ Repair any damaged areas within a channel identified during inspections. Erosion rills or gullies should be corrected as needed. Bare areas should be replanted as necessary.</li> </ul>	Semi-annual
<ul style="list-style-type: none"> <li>■ Declog the pea gravel diaphragm, if necessary.</li> <li>■ Correct erosion problems in the sand/soil bed of dry swales.</li> <li>■ Plant an alternative grass species if the original grass cover has not been successfully established. Reseed and apply mulch to damaged areas.</li> </ul>	Annual (as needed)
<ul style="list-style-type: none"> <li>■ Remove all accumulated sediment that may obstruct flow through the swale. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 in. at any spot, or covers vegetation, or once it has accumulated to 10% of the original design volume. Replace the grass areas damaged in the process.</li> <li>■ Rototill or cultivate the surface of the sand/soil bed of dry swales if the swale does not draw down within 48 hours.</li> </ul>	As needed (infrequent)

## **Additional Information**

Recent research (Colwell et al., 2000) indicates that grass height and mowing frequency have little impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

## **References**

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: <http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm>

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: [cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp\\_files.cfm](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm)

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.