

Erosion, sediment and dust: Treatment train



Environment
Protection
Authority Victoria



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Guidance sheet

Using a treatment train approach to eliminate or reduce the risk of harm from erosion, sediment and dust

Description

The treatment train approach is when more than one control type reduces the risk of harm from water erosion, sedimentation and dust.

Water runoff can carry a range of pollutant types and sizes. You may need several techniques to treat the range of pollutants that may be present in runoff.

When to use this control

Use a treatment train approach to optimise pollutant removal from runoff. You can design it to address both:

- water quantity – where the system detains high volume flows and slows down their velocity
- water quality – where it removes a range of sediments, pollutants and nutrients from runoff water before it is discharged into receiving catchments.

Treatment elements are arranged where they can have the most effect. Depending on the size of pollutant they filter, they are:

Treatment stage	What it does
Primary	Uses screens and coarse filters to remove litter, coarse debris and coarse sediment for example buffer strips, grassed swales, sediment basins, ponds, litter traps, porous and permeable pavements.
Secondary	Provides a greater degree of water quality treatment than primary treatment by using settlement (for finer sediments) or filtration. Pollutants targeted by secondary treatments are fine sediment and associated attached nutrients. Examples include swales, infiltration trenches, porous paving.
Tertiary	Enhanced sedimentation and filtration, removes dissolved pollutants (usually nutrients) through biological uptake for example. wetlands and bioretention systems.

More information

See our website: epa.vic.gov.au/for-business/find-a-topic/erosion-and-sediment/advice-for-businesses

Contact us:

1300 372 842 (1300 EPA VIC) or contact@epa.vic.gov.au

The actions you take and the controls you decide to implement will support you to comply with your general environmental duty and other duties under the *Environment Protection Act 2017*.



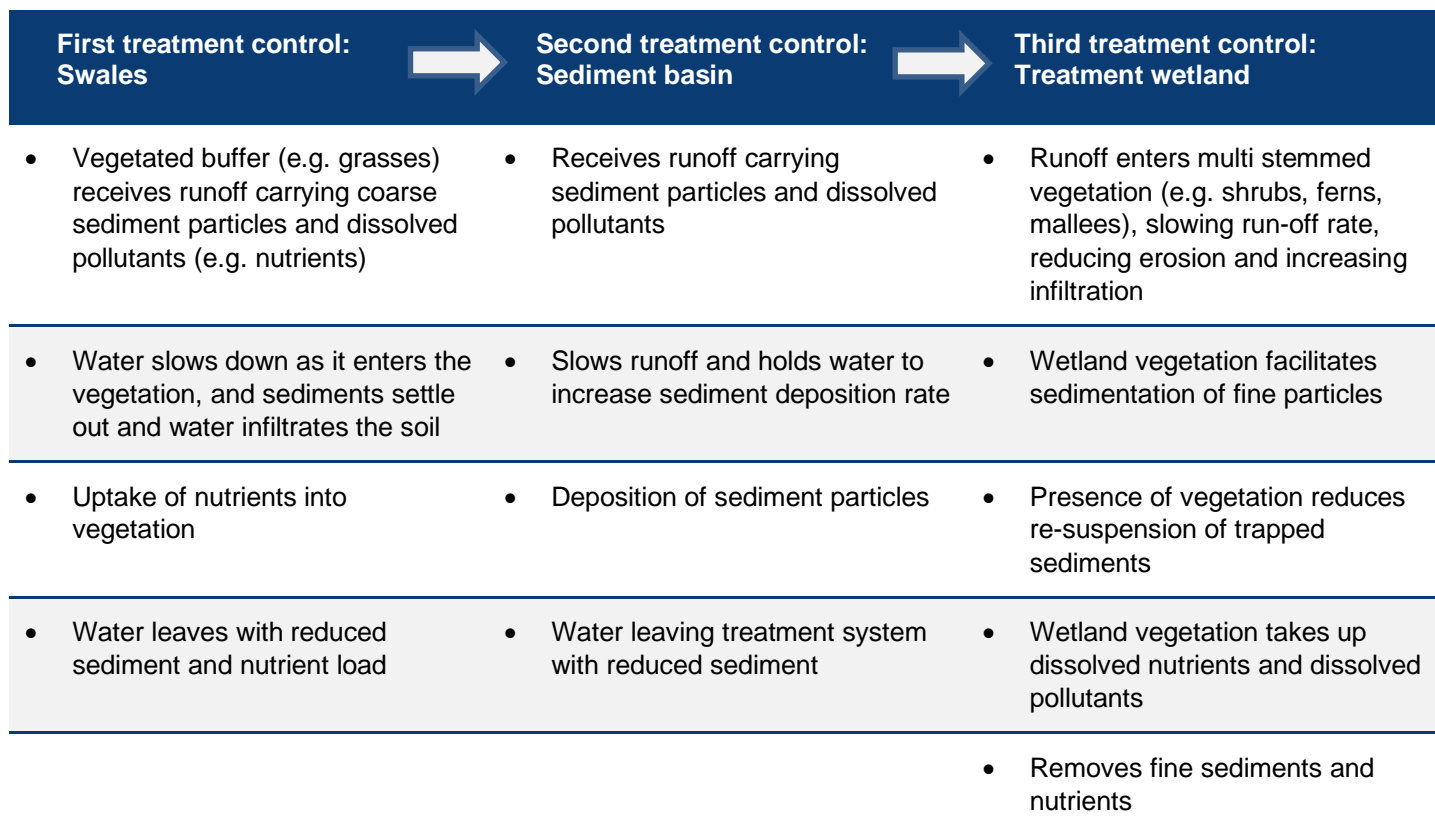
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Suitable for: where there are coarse, medium, fine sediments and nutrients.

When to use this:

- Where land use activities could result in erosion, sediment, dust deposition and runoff.
- There is a need to improve water quality, reduce runoff volumes or flow control.
- To improve visual and amenity outcomes for the community.

There are various configurations for treatment trains, dependent on your circumstances. A simple example to improve water quality showing three treatment controls is:



Treatment train processes include:	
Screening	Pre-filtering technologies, litter baskets, gross pollutant traps
Sedimentation	Sediment basins, ponds, wetlands
Adhesion and filtration	Bioretention systems, infiltration systems and wetland
Biological uptake	Wetlands and biofiltration systems



Figure 1. Swale under construction. (Photo courtesy of Fulton Hogan.)

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Details and considerations

When you are designing a treatment train system, consult a suitably qualified professional to ensure your treatment measures are appropriately designed and installed. See [Work with an environmental consultant](#) (EPA website).

Things to consider:

- Install primary, secondary and tertiary treatment control measures based on site-specific hazards and level of risk in your project or activities. Selection and order of treatment is important. Confirm your controls are designed and installed to capture sediment loads from your activities.
- The design and location of the treatment systems are suited to the physical constraints of the location, catchment and flow patterns.
- Where there are coarser sediments these generally require removal so that treatments targeting finer sediments can operate effectively.
- Conduct post-installation inspection of controls and maintain the controls as required.
- Regularly review the effectiveness of the treatment train to confirm its meeting the set objectives (for example water quality) and adjust treatment measures where improvements are identified.
- Plan for the removal and appropriate disposal of accumulated sediments and pollutants in accordance with site waste treatment measures. Sediments will build up over time, so regular maintenance to remove the accumulated sediment is required to retain the treatment efficiency and minimise the risk of resuspension and export of sediments previously trapped in the system.
- Treatment train systems retain much of the pollution load passing through them, particularly sediments and products of biodegradation and may require partial reconstruction or complete replacement after a period of time.

For further reading and reference

[International Erosion Control Association Australasia](#) – information and resources on erosion and sediment control.



These are *examples or options only* of what you could put in place to eliminate or reduce the risk of harm to human health and the environment. You can implement other controls, so long as you can demonstrate you have eliminated or reduced the risk of harm as far as [reasonably practicable](#) (EPA website).

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Glossary

Bioretention system	Usually an excavated basin or trench that is filled with porous media and planted with vegetation.
Biofiltration system	Process of filtering water through biologically influenced media.
Coarse sediment	Consists of coarse silts and sand particles.
Finer sediment	Consists of clay-sized particles and fine silt.
Gross pollutant trap	Gross pollutant traps (GPTs) are devices for the removal of solids conveyed by runoff that are typically greater than 5 millimetres.
Sediment basin	A basin/pond/dam built to collect and settle sediment in water. The sediment basin promotes settling of sediments through the reduction of flow velocities and temporary detention.
Swale	A continuous linear vegetated depressed area in a broader tract of land designed to capture and convey runoff.

Disclaimer

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