



A guide to reducing contaminants entering tile drains



New tile drain

Many farms in Southland are dependent on an efficient soil drainage system to maintain pasture production and use. This is made up of subsurface mole and tile (pipe) drains that transport soil water to open drains and waterways.

Typically this water also contains nutrients, bacteria, sediment and chemicals. Artificial drainage provides a direct pathway for these contaminants to enter waterways, bypassing natural filtering or attenuation processes like wetlands or riparian zones.

The challenge is how to maintain an effective drainage system with minimal contamination to reduce negative effects on waterways and estuaries. There are a number of things you can do meet this challenge.

► Tile drain installation

Surround tile in pea gravel and a filter cloth to stop sediment entering tiles. This will also substantially improve drainage

performance and greatly reduce blockages. Or, instead of pea gravel try wood chips. They will reduce nitrogen through a process called denitrification (bacteria and carbon change nitrogen into a harmless gas, and the wood chips last for decades).

► Tile drain placement

Keep well away from sources of contaminants like septic tanks, effluent ponds, standoff pads, offal holes, silage stacks, fuel storage and chemical sheds because leachate and chemicals from these will move through the soil into the drainage water.



Sediment trap at end of a tile system

► Tile drain maintenance

Incorporate inspection and cleaning ports in the system to enable quick access for blockages, water testing and cleaning. If cleaning is required, create a holding pond to prevent discharge into a waterway. Mapping all tile drains and outfalls helps with future maintenance and preventing contaminants entering the system.

► Land management above and beside tile drains

Don't pile or spread effluent, sludge, animal bedding materials or fertilizer above a tile. Avoid intensive winter grazing of forage crops above a tile drain by retaining a buffer of grass on top. Practice strategic grazing or duration-controlled grazing strategies to reduce the amount of sediment and nitrogen leaching through the soil or moving into a critical source area to then enter the drainage system. If a paddock has lots of tiles and/or mole drains consider not using these paddocks for crops or spreading effluent and sludge, limit fertilizer applications and treat drainage water before it leaves the farm.

► Treating tile drain discharges

Before the tile drain water is discharged into a waterway it can be treated by creating a sediment trap, wetland, bioreactor bed or a vegetated filter. This will reduce the amount of contaminants eventually entering a waterway and estuary. Key options include:

- Sediment traps in a stock-excluded, fenced open drain with long grass and some plantings.
- Constructed wetlands in critical source areas, fenced and some plantings.
- Constructed wetland or sediment trap in riparian zone at tile outlet.
- Bioreactor bed underground in tile system near outlet
- Vegetated area (grass, reeds etc.) for tile discharge to flow overland in a riparian zone or critical source area before entering waterway.

More information

There is a range of supporting factsheets on critical source areas, riparian management, constructed wetlands and sediment traps. You'll find helpful information on the DairyNZ and Beef + Lamb websites:

- www.dairynz.co.nz
- www.beeflambnz.com

Further assistance

For advice and designs to suit your specific needs, call 0800 76 88 45 to arrange a free visit by Environment Southland's land sustainability team.