

# Technical Guidelines: Using Driplines for wastewater disposal

The use of drippers to apply treated wastewater to the land application area is an efficient method of wastewater disposal. A correctly maintained Aerated Wastewater Treatment System (AWTS) can also provide water for your garden.

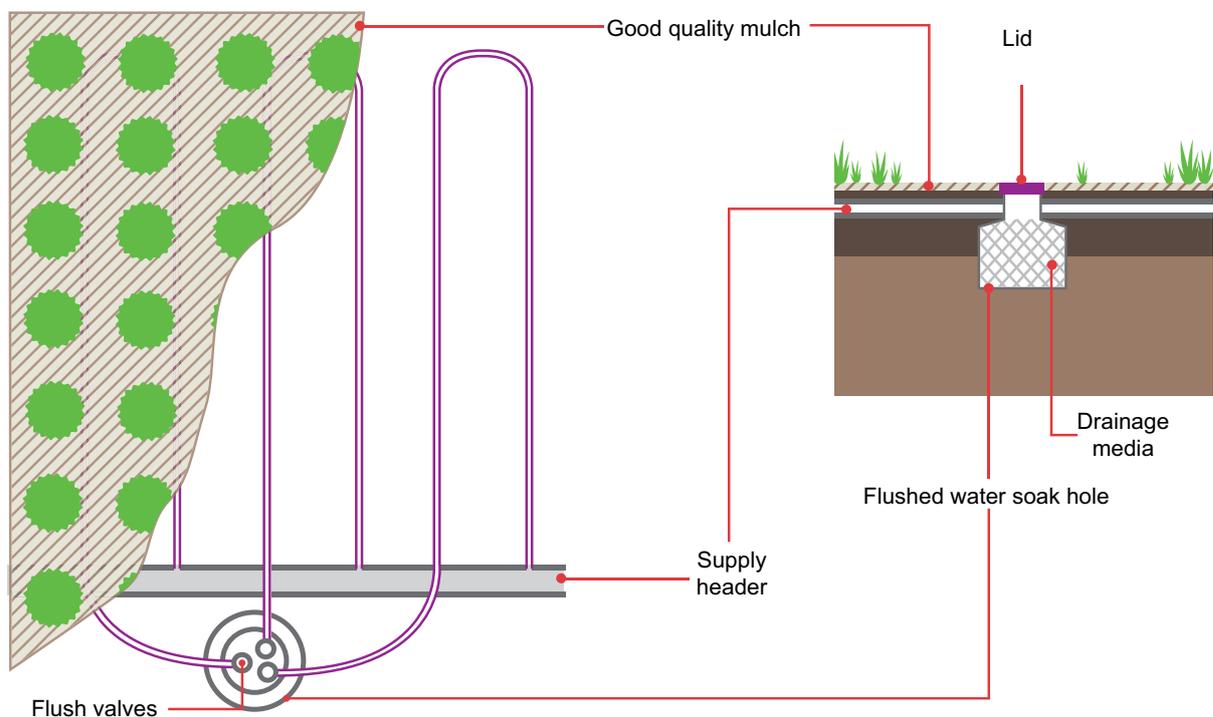
However, dripper systems that are not well designed, correctly installed and appropriately maintained, can pose a significant public health risk and environmental hazard.

There are two methods of discharging wastewater through driplines to a land application area. The choice is based on personal preferences and site constraints. The options are, covered surface or shallow subsurface drip irrigation systems.

The following design guidelines provide the minimum design and construction requirements. The quality of effluent to be discharged through drippers must meet the standard specified by the dripline supplier.

In the Bay of Plenty region wastewater discharged by drippers must go through secondary treatment and must be better than  $BOD_5$  30 grams/ $m^3$  and TSS 45 grams/ $m^3$ . Some more rigorous parameters are set out in NZS 1547:2012 Appendix M section M2.1.

Diagram 1: **Drip irrigation system - Plan view and cross section showing the flushing to soakhole option**



*Acknowledgement: This guideline is based on a publication from Swan Hill Rural City Council Public Health Service and amended to suit New Zealand Practices and conditions.*

## General Guidance

This information applies to all dripper based land application areas.

- The renovated wastewater is discharged from drippers along the length of the flexible, low density polyethylene dripline. The drippers can be moulded into the dripline or mounted externally. Provision must be made in the design of the dripper to prevent root intrusion.
- A disc or mesh filter must be installed on the pump discharge line to protect the dripline from any solid particles found in the wastewater which have the potential to clog drippers. The mesh/disc filter must be 130 micron in size.
- The driplines should be 1 m or less apart. The drippers shall be pressure compensated and anti-siphon type. The drippers have a variety of flow rates and spacings. The dripline should be selected and spaced at sufficient intervals to ensure the Design Irrigation Rate (DIR) in mm/day is not exceeded and that effluent is distributed evenly. Where the land application area is steep or undulating a non leakage dripline should be used.
- Driplines must not exceed 60 m in length and shall be placed across the slope. The dripline must be coloured purple or have a purple stripe to indicate that it contains wastewater.
- Provision shall be made for flushing of the lines whenever the AWTS is serviced. A single valve can be placed in the return line and the flushed wastewater returned to the primary chamber, refer to diagram 3. Where it is not possible or desirable to return the flushed wastewater to the primary chamber, a valve in a valve box discharging to a soakage trench must be provided. The trench or soakholes shall have a basic capacity of 6 x the volume of the header and laterals and be filled with drainage media.
- Where the land application area is split into two or three parts the areas must be equivalent in size and be dosed alternately using a sequencing valve.
- All flush valves and air/vacuum valves must be installed in boxes level with the ground or mulch surface. The boxes shall have purple lids to indicate the presence of wastewater.
- The land application area should be setback 3 m from dwellings and other buildings and 1.5 m from boundaries.
- The location of the land application area and the driplines should be shown in the as-built plan. The as-built should also show buildings and boundaries. Photos can supplement the as-built.

## Covered Surface Drip Irrigation

This additional information applies only to covered surface drip irrigation land application systems. The dripline used for surface irrigation must be pegged to the surface of the ground and covered with a mulch or granulated bark. Mulch or bark has a large surface area which assists in evaporation of the wastewater. The mulch must have a depth of at least 150 mm and must be renewed at intervals to maintain the required depth. Some mulch decomposes quite quickly and will need replenishing frequently. The mulch must not be allowed to erode or decompose so that the drippers are exposed. The land application area must be planted to ensure evapo-transpiration of the effluent. Refer to Diagram 1 and 2.

### Design and Construction

This method is used when the land application area is to be planted.

- Before construction, all overgrowth must be removed from the land application area. The overgrowth could be sprayed with a herbicide or cut to a low level. The ground surface should be scarified with a rake or similar, before placement of the dripline.
- All pipework feeding the driplines must be buried to a depth of at least 200 mm to reduce the risk of damage.
- The placement of the mulch shall cover all driplines and extend 500 mm beyond the driplines.
- The area must be intensively planted. A list of suitable plants is available on our website [www.boprc.govt.nz/oset](http://www.boprc.govt.nz/oset)
- Once mature, the plants should totally cover the land application area. This is to maximise evapo-transpiration and to discourage access by humans. Any plants which die must be replaced.
- The mulch will gradually decompose and will need to be topped up at intervals. The mulch at the edges of the land application area may be disturbed by birds. The edges should be covered by durable bird netting in accordance with *NZS 1547:2012 section M3.2*.



### Related material

AS/NZS 1547:2012 "On-site domestic wastewater management" provides design methods for irrigation systems. Please refer to the standard for this design information. These guidelines support the standard.

Diagram 2: Covered surface drip cross section

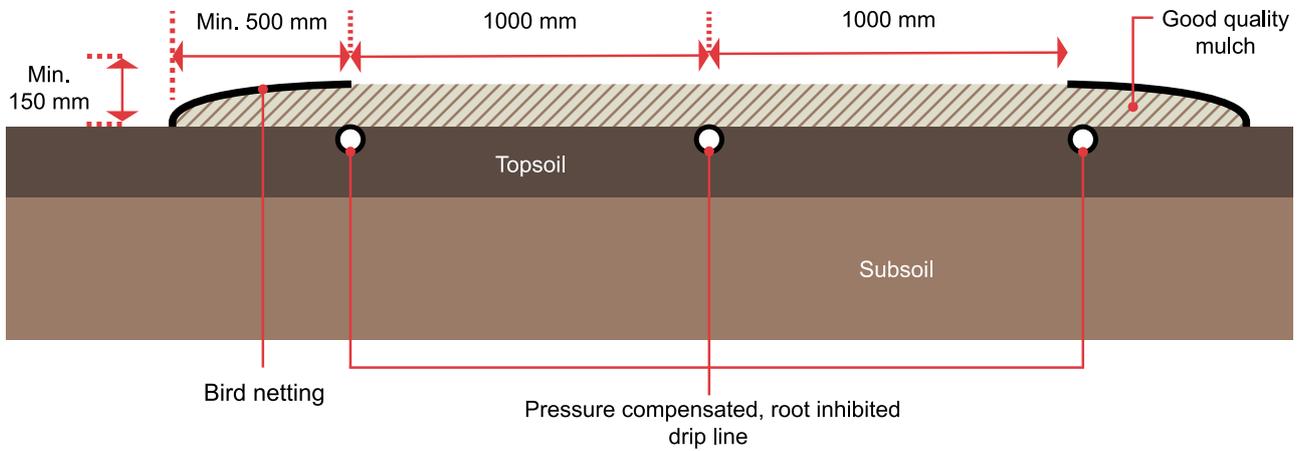


Diagram 3: Drip irrigation system - example layout of components

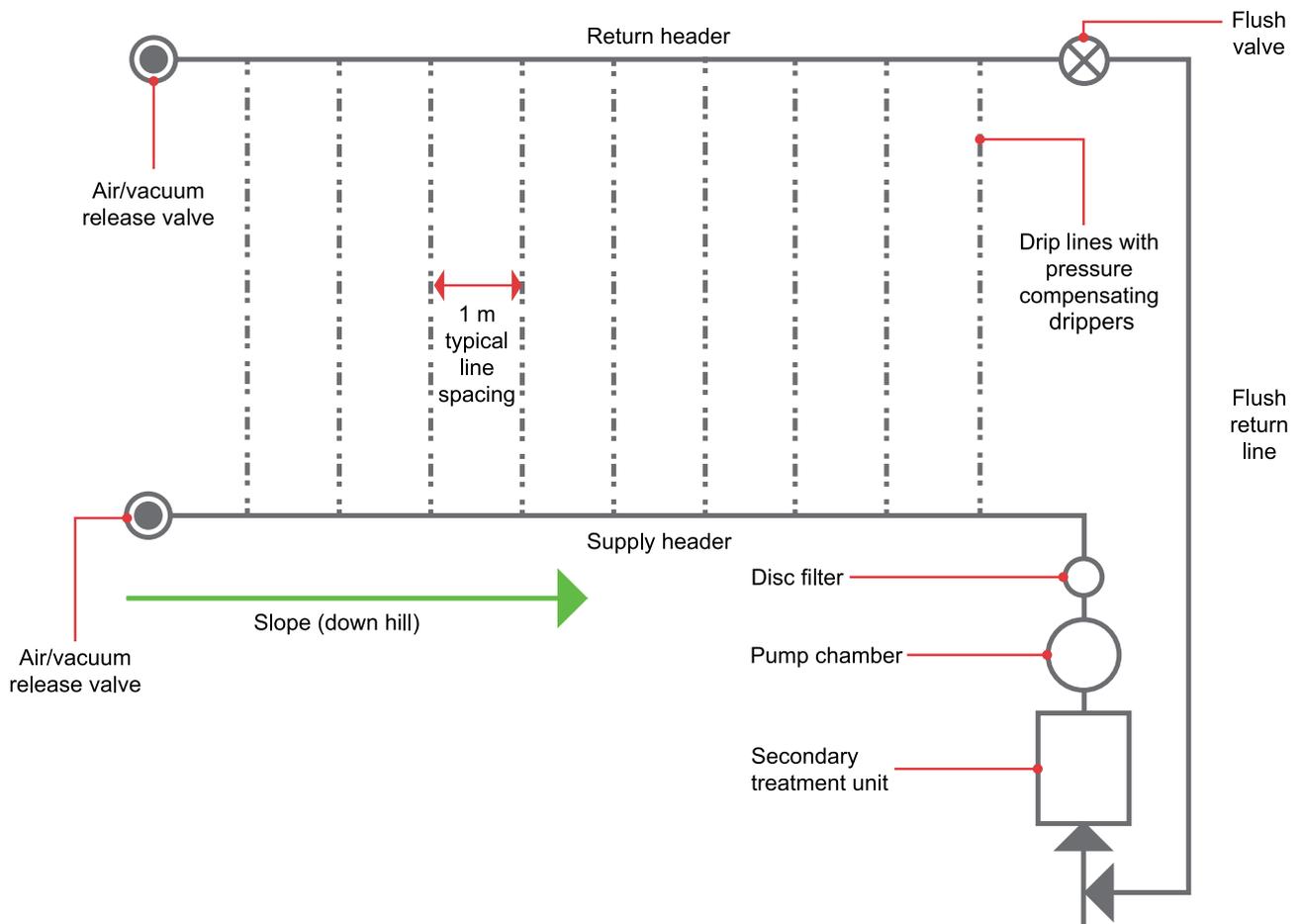
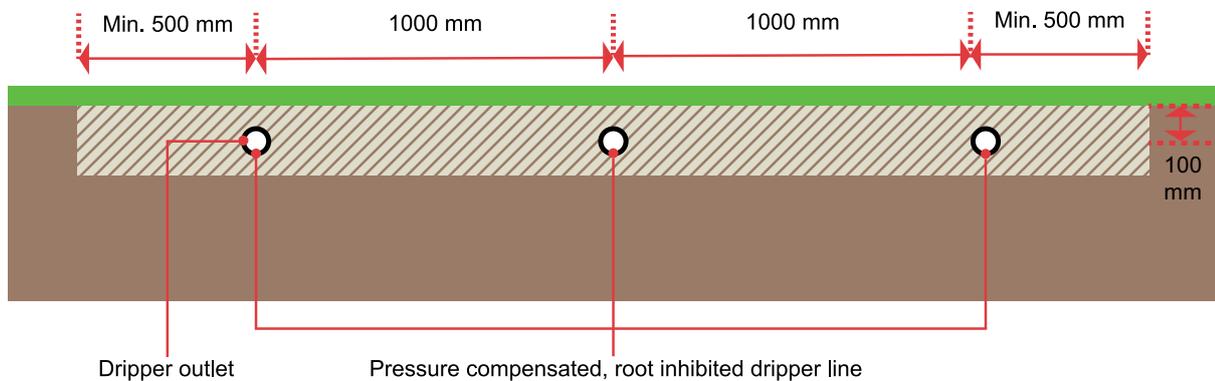


Diagram 4: **Shallow sub-surface drip irrigation system cross section**



## Shallow Subsurface Drip Irrigation

The dripline used for subsurface irrigation is buried within the topsoil layer between 100 and 150 mm deep. The dripline is installed in small trenches or mole-ploughed. Lawn is grown over the land application area to assist transpiration. Refer to Diagram 4.

### Design and Construction

This method is used when the land application area is under a lawn.

- A pump of adequate size is required to operate the drippers within the dripline. A pressure of at least 100 kPa is required.
- All landscaping around the dwelling should be completed before the driplines are installed in the land application area. This ensures that all pipework and driplines are at the correct levels.
- All pipework feeding the driplines shall be buried to a depth of at least 200 mm to reduce the risk of damage. Driplines are installed between 100 mm and 150 mm deep.
- The land application area must be planted out with lawn and maintained to a high standard.



*A labyrinth path dripper inside the dripline*



*An Air/Vacuum release valve must be installed at the highest point of the system*



*Where the soak hole option is chosen, the flush valves can be terminated in a chamber over the soakhole*



*Subsurface dripper system fenced off to protect from stock*



*Planted mulch bed*



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