ISSUE 637

BULLETIN

DOMESTIC ON-SITE FOULWATER TREATMENT

April 2019

- An on-site treatment system is an option where no sewer connection is available or, where permitted, an owner wants to reduce demand on mains foulwater networks.
- To ensure optimum performance, correct design and installation of the system together with ongoing maintenance are essential.
- This bulletin looks at options available for on-site treatment and disposal systems for domestic installations. It updates and replaces Bulletin 485 *Domestic on-site wastewater systems*.

1 INTRODUCTION

1.0.1 Terms used to describe used water from household activities include:
- blackwater – from waste disposal units, toilets and urinals that is likely to contain solid and/or liquid excreted human waste
- greywater – from domestic baths, showers, basins, laundry and kitchen
- foulwater – the discharge from any sanitary fixture or sanitary appliance.

1.0.2 In most cases, domestic on-site management is required because of the lack of public sewer mains. Such situations typically include:
- houses on farms, lifestyle blocks and rural subdivisions
- remote off-grid houses, cabins and lodges.

1.0.3 Effluent from household activities can cause pollution and create a significant health risk. Unless appropriately managed, it has the potential to contaminate waterways and groundwater and to spread infectious diseases.

1.0.4 Under New Zealand Building Code clause G13 *Foul water*, the drainage system from a building must be connected to a sewer if it is available. If there is no sewer available, an on-site treatment system that receives, treats and disposes of blackwater and greywater within the property boundaries is required.

1.0.5 An on-site treatment system must be designed specifically to accommodate the particular site conditions and the occupant loads.

1.0.6 Septic tanks are less acceptable as a disposal method particularly in built-up areas because of diminishing lot size and in areas of poor drainage, high water tables or steep slopes.

1.0.7 This bulletin discusses options available for domestic on-site foulwater treatment systems. It updates and replaces Bulletin 485 *Domestic on-site wastewater systems*.

2 STATUTORY REQUIREMENTS

2.0.1 Under the Building Act 2004, the installation of on-site foulwater systems must meet the requirements of Building Code clauses:
- B1 *Structure*
- B2 *Durability*
- G1 *Personal hygiene*
- G13 *Foul water* (sanitary plumbing and drainage).

2.0.2 The Building Code covers installation under G13/VM4. This Verification Method gives a design method and construction details using AS/NZS 1547:2012 *On-site domestic wastewater management*. Discharge requirements are described under Resource Management Act 1991 section 15 *Discharge of contaminants into environment*. Section 15 requires that any discharge may occur only where permitted by a rule of a regional plan, resource consent or regulations. This means if a discharge from an on-site foulwater treatment system is not part of the permitted activities within local planning rules, a resource consent is also required.

2.0.3 In many cases, local authorities publish comprehensive guidelines and/or specific requirements to assist with design and construction of an on-site disposal systems. For example, Auckland Council provides the technical publication On-site Wastewater Systems: Design and Management Manual.

2.0.4 Installing an on-site treatment system requires a building consent. The installation must be undertaken or supervised by a certified drainlayer.

2.1 STANDARDS

2.1.1 AS/NZS 1547:2012 (as cited by G13/VM4 as satisfying the performance criteria of clause G13) is a general standard for flows of up to 14,000 litres per week and for a population equivalent of up to 10 people.

2.1.2 The following standards are intended to set performance criteria against which different types of systems can be assessed. They also provide guidance on installation, operation and maintenance:
- AS/NZS 1546.1:2008 *On-site domestic wastewater treatment units – Septic tanks*
- AS/NZS 1546.2:2008 *On-site domestic wastewater treatment units – Waterless composting toilets*
- AS 1546.3:2017 *On-site domestic wastewater treatment units – Secondary treatment systems* (replaces AS/NZS 1546.3:2008 *On-site domestic wastewater treatment units – Aerated wastewater treatment systems*).

3 TREATMENT SYSTEMS

3.0.1 On-site treatment consists of two stages (Figure 1).

3.0.2 In the first stage, blackwater and greywater drains to a single or multi-chambered tank system where solid matter is separated out and effluent treatment begins.

3.0.3 In the second stage, effluent (liquid discharge from the first stage of treatment) flows or is pumped to a disposal field for further treatment by soil bacteria.

3.1 LOCATION OF TREATMENT SYSTEMS

3.1.1 The location of the chambers of a treatment system must not affect the building's structure. Local authorities generally have discretion over the distance from buildings and boundaries, but they should be located a minimum of 5 m from any building.

3.1.2 Heavy service vehicle access must be provided for installation, cleaning and venting.

3.1.3 Chambers may be buried (most common option) or installed above ground.

3.1.4 Buried systems must:
- be able to resist the loads from the surrounding soil
- resist hydrostatic pressures from the groundwater
- prevent the entry of groundwater into the system

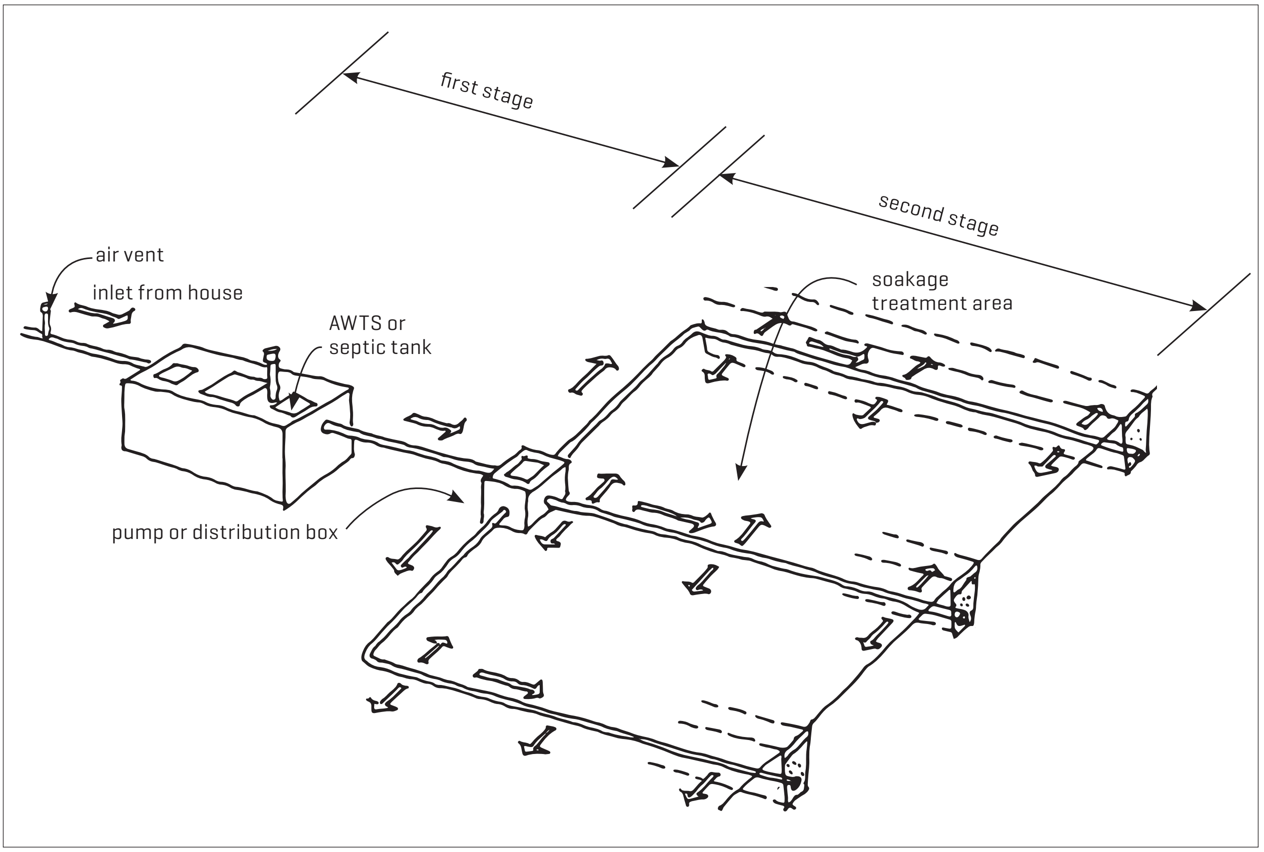

Figure 1. Treatment system.

- prevent the ingress of surface water
- have access hatches that are secure against entry by children or pets
- be clear of trafficked areas.

3.1.5 Above-ground systems must be:
- installed to prevent overturning or movement in an earthquake
- durable and UV resistant
- watertight
- secure against entry by children or pets
- located sufficiently lower than the building it serves if a gravity feed to the tank is used – otherwise, a pumped system must be used.

4 FIRST STAGE – TREATMENT

4.0.1 The capacity of an on-site treatment system must be designed to accommodate the worst-case scenario.

4.0.2 The first stage of treatment will occur in the primary chamber of the septic tank. Solids are separated from effluent, and anaerobic bacteria will begin the treatment process. The secondary treatment process that then occurs is by either:
- an aerated water treatment system (AWTS)
- an advanced sewage treatment system (ASTS).

4.0.3 AWTSs and ASTSs produce secondary treatment effluent, which involves both anaerobic (without oxygen) and aerobic (with oxygen) treatment to a much higher level, resulting in effluent that is suitable for garden (usually excluding fruit and vegetables) or landscape irrigation. At the highest level of treatment, the treated effluent can be used in non-potable situations such as toilet flushing, vehicle washing and fire-fighting.

4.0.4 Systems producing secondary treatment effluent were once only installed where septic tanks could not be used, such as areas with poor drainage and/or a high water table. Now, septic tanks are not permitted in many areas, and a secondary treatment system is the only permitted option.

4.0.5 Discharge from the building foulwater drains is gravity fed or pumped to a treatment tank via a conventional drainage system. An air vent must be included just before the connection into the treatment tank.

4.0.6 The use of waterless composting toilets can reduce the load on an on-site treatment system.

4.1 AERATED WATER TREATMENT SYSTEMS

4.1.1 Proprietary aerated water treatment systems follow the same general aerobic treatment method of foulwater in which air is pumped into an aeration chamber.

4.1.2 Discharge is progressively filtered and treated as it moves through the chambers of a multi-chambered tank, which may be in one unit or a series of individual tanks (Figure 2 and Table 1).

4.1.3 Aerated systems rely on the continuing functioning of a pump to move effluent from the final chamber, so an alarm system to indicate electrical or mechanical pump failure is essential. A warning light should come on if the system malfunctions, but regular maintenance is also very important.

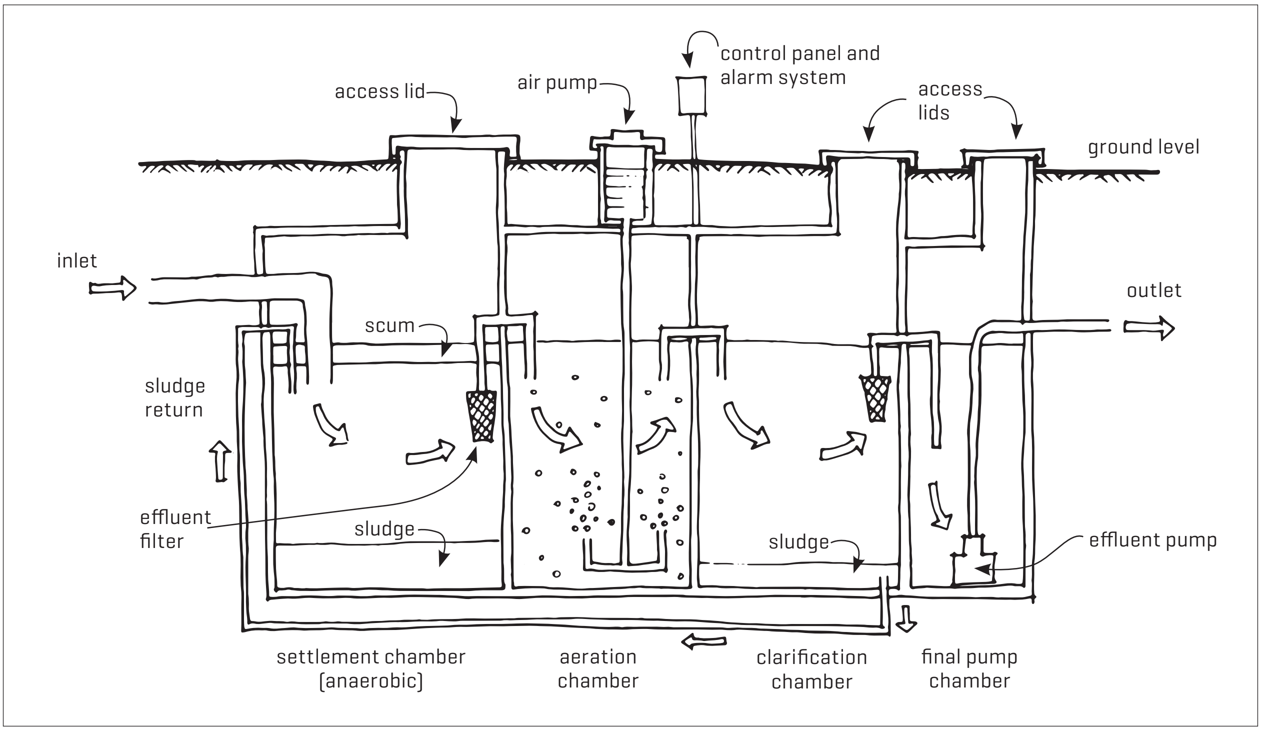

Figure 2. Typical aerated water treatment system.

4.1.4 Infrequently used systems that can be heavily loaded for short periods, such as holiday homes, may suffer from shock loading, where a sudden, large volume of effluent enters the treatment system. The bacteria in an AWTS require a regular source of effluent to maintain population numbers. When such a system is shock loaded, there may initially be insufficient bacteria to deal with the volume of effluent. This potentially causes odour problems and risks the disposal system becoming clogged. Some systems have features such as sludge recirculation to help keep bacteria alive during periods of non-use. Ensure that any aerated system is appropriate for the situation.

4.2 ADVANCED SEWAGE TREATMENT SYSTEMS

4.2.1 Advanced proprietary sewage treatment systems incorporate a packed bed or textile bed reactor where effluent trickles through or is sprayed over a reactor material that contains micro-organisms that treat any remaining fine solids. The reactor material may be graded sand or a special textile material.

4.2.2 A number of different systems are available – for example, a unit containing a reactor medium over which effluent passes or a bottomless reactor bed where effluent trickles through the medium then into the soil below.

4.2.3 Some reactors recirculate the effluent by collecting it after it has passed through the reactor material. A portion (approximately 70%) is resprayed over the reactor, while the rest is diverted to the disposal field. Most effluent will pass over the reactor material several times before disposal, resulting in almost clear, odourless effluent.

Table 1. Aerated water treatment system process.

Stage	Treatment type	Process
Chamber 1	Anaerobic	• Settlement of suspended solids and partial anaerobic decomposition. • Effluent passes through screen filter to aeration chamber.
Chamber 2	Aeration	• Pumped in air creates turbulence and aerates effluent to facilitate aerobic bacterial activity. • The chamber may incorporate a bioreactor (such as ultraviolet light or chlorination) to provide additional disinfectant treatment for bacteria. • Effluent passes through a second finer filter and into the third chamber. • In some systems, the effluent may also be disinfected by ultraviolet treatment or chlorination at this stage. • Effluent flows through a smaller filter to the pump.
Chamber 3	Clarification	• Fine sludge particles settle and are pumped back to the first chamber.
Chamber 4	Pump	• A submersible pump distributes effluent under pressure via a small diameter drip line to the disposal field.

4.2.4 Dosing rates must be precisely maintained, and all filtering must occur during effluent movement through the tank prior to passing through the reactor. If the reactor material must also act as a filter, it is likely to become clogged and fail. In some systems, units containing the reactor material are easily removed and can be hosed clean and replaced.

4.3 COMPOSTING (WATERLESS) TOILETS

4.3.1 Composting toilets, which eliminate the need for flushing water, break down human waste and other added organic material in an aerobic process, the product of which should be an odourless soil-like compost that can be used on site.

4.3.2 For the system to work properly, the moisture content must be kept as low as possible, so urine must be either eliminated by evaporation or collected separately. Urine can be disposed of via a foulwater treatment system – a rock-filled soak pit. Urine (which is usually sterile) can also be used as a nitrogen-rich fertiliser with best results after it has been stored for a few weeks.

4.3.3 Composting toilets are not permitted where a mains sewer system is available (unless a waiver is granted by the local authority). The plumbing system must comply with clause G13, and composting toilets must comply with AS/NZS 1546.2:2008.

4.3.4 Self-contained composting toilets fall into one of two types:

- Batch-type units (which are most common) usually consist of two or more bins. When one bin is filled, it is removed to the outside to allow the composting process to continue generally for 5–6 weeks. The contents of the bin are then buried, and the bin is returned to replace the full one. Batch-type units must be vented and must have separate disposal for urine.

Pedestal for a split-system composting toilet where collection/treatment chambers are located below the bathroom floor.

- Continuous-type units consist of a single chamber where all waste is collected. When composting has been completed, the contents are removed through an access hatch. Positive air pressure is generally required to minimise odours. Ventilation is usually provided by means of an air inlet and a small extract fan. Excess moisture needs to be drained, and adding organic bulk material aids in the decomposition process.

4.3.5 Use of any type of composting toilet system involves a commitment to a regular monitoring and maintenance regime. Without appropriate monitoring and maintenance, the end product may not be properly composted, resulting in potential health risks and odours.

4.4 BIOACTIVE SYSTEMS

4.4.1 Two-chamber bioactive systems are available that separate blackwater and greywater at their source for selective treatment within the system. Up to 95% of solids and scum are removed from the sewage right at the beginning of the natural treatment process by using a proprietary natural filtering module that reduces the solids (utilising worms and other bioactive organisms) to form a compost-like product. The decontaminated water separated off at the start of the process is then filtered and treated through a number of natural processes before being discharged into a disposal field by gravity or pump.

4.5 SEPTIC TANKS

4.5.1 Below-ground septic tanks are typically found on older properties – being installed before the development of newer-generation treatment systems. (Installation of a new septic tank may not be permitted by a number of regional or territorial authorities.) A septic tank produces effluent with a minimal level of treatment involving only separation of solids and some preliminary anaerobic action.

4.5.2 In a septic tank, partially decomposed solids form a sludge on the tank floor, and lighter materials such as fat and grease form a floating layer of scum in a process of stratification. The partially treated effluent, which still contains small solid particles, flows out of the septic tank as more foulwater flows in (Figure 3). Tanks sometimes incorporate tees or baffles at inlet and outlet pipes to slow incoming waste and reduce sludge disturbance and gas baffles to deflect gas from escaping through the outlet. The process of decomposition is a natural one, which does not rely on the introduction of additives.

4.5.3 Septic tanks (which may be single-stage or two-stage configurations) must be constructed to the minimum requirements of AS/NZS 1546.1:2008.

4.5.4 Undecomposed solids that settle on the tank floor as sludge require pumping out approximately every 3–5 years depending on usage. Septic tanks must be provided with maintenance access by means of risers and hatches that cannot be opened by children.

5 SECOND STAGE – LAND APPLICATION

5.0.1 Following treatment in a treatment system or septic tank, partially or fully treated effluent must be

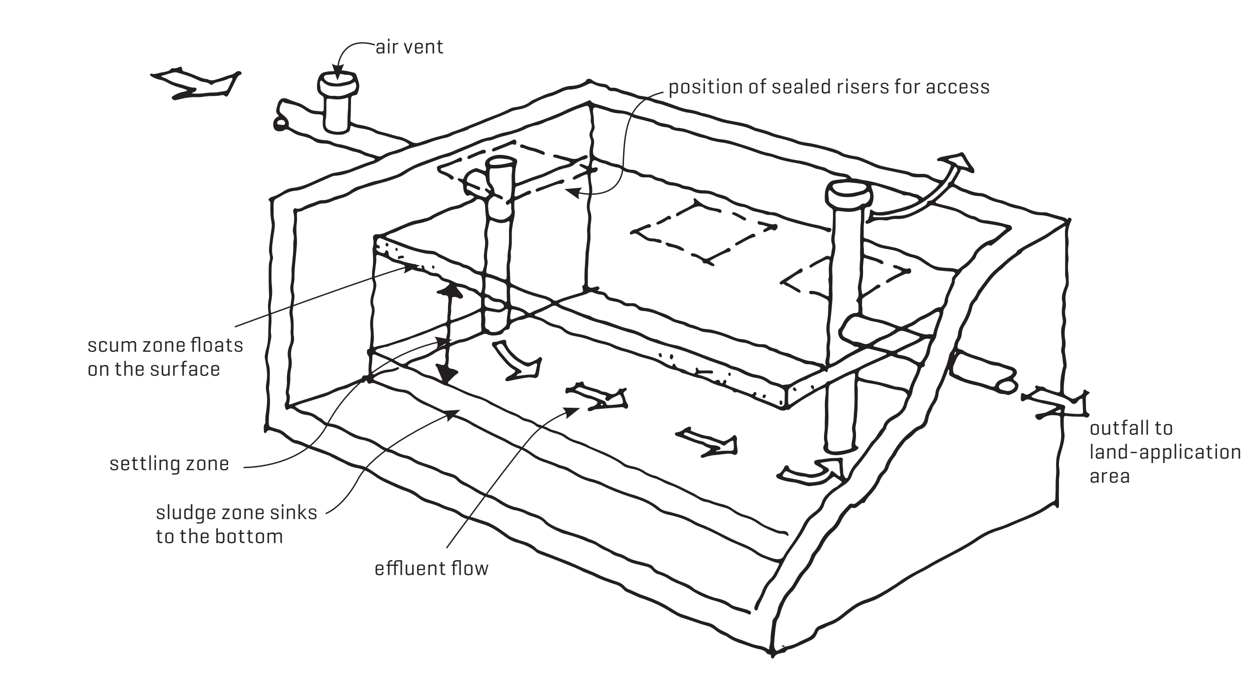

Figure 3. A single-chamber septic tank.

moved by gravity or pump to a disposal field or land-application area where bacteria in the soil continue the process (see Figure 1).

5.1 SITE ANALYSIS

5.1.1 Site investigations for an effluent disposal system must consider the following:

- Nature of the subsoil, including percolation rates and stability. Note that AS/NZS 1547:2012 relies on soil profile inspections whereas AS/NZS 1546:2008 relies on the percolation test.
- Site characteristics such as:
  - land slope
  - natural drainage characteristics including subsoil drainage capacity
  - (seasonal) water table, surface water run-off and flood tendency
  - proximity of water courses
  - physical size and shape of the field
  - vegetation and planting – existing and proposed
  - field location to avert vehicular traffic and grazing animals.
- Potential effects on:
  - downstream neighbouring properties
  - downstream food sources such as mussel farming
  - natural water courses – the ocean and estuaries, lakes, rivers and streams
  - local ecology.

5.2 DISPOSAL SYSTEMS

5.2.1 A land-application treatment may comprise:

- drip line
- spray irrigation system
- low-pressure effluent distribution (LPED)/dose loading system
- sand mound system
- proprietary aerobic treatment system
- evapotranspiration system (ETS)
- gravity soakage trenches/bed including gallery or tunnel-type systems for sand and rapid-draining soils.

5.2.2 Irrigation systems are only suitable for secondary treatment effluent and are most commonly used with aerated systems. Effluent is pumped and distributed over the entire field while in operation.

5.2.3 Several irrigation systems are available including:

- a subsurface drip line, where lines are buried 100–150 mm deep in the soil
- a covered surface drip, where lines are laid on the surface and covered in mulch or bark
- a spray irrigation system, where sprinklers spray treated and disinfected effluent on the ground surface.

5.2.4 Surface drip and spray irrigation systems are not suitable for use with septic tanks and are not permitted in some locations. There may also be health risks associated with spray irrigation because of the potential contact of effluent with people, animals and insects.

5.2.5 Effluent can be discharged more evenly across the disposal area by pump via **low-pressure effluent distribution (LPED) or dose loading** by siphon. A controlled dosing at regular intervals over a 24-hour period ensures the area gets a rest period between soakings. It also eliminates the likelihood of disposal surges that may occur at periods of high household usage.

5.2.6 Alternatively, even soakage can also be achieved by nesting the perforated dose line within a drainage coil installed in the trench (Figure 4). As the effluent moves along the coil, it spreads more evenly across the entire area.

5.2.7 A distribution box can be used to direct effluent to different parts of the field. This allows the trenches to be periodically rested to prevent the drains from becoming overloaded.

5.2.8 As the soil-filtering process provides the secondary treatment, the disposal area for both gravity soakage and LPED disposal should be fenced off to prohibit access.

5.2.9 Where it is not possible to achieve a suitable trench depth due to a high natural water table or poor percolation, **soil or sand mounds** can provide a suitable filtering depth for effluent treatment. Effluent can trickle through the mound into the underlying soil.

5.2.10 With **evapotranspiration systems**, effluent is dispersed into beds planted with selected, shallow-rooted plants. The plants absorb effluent through their roots and release water through their leaves into the atmosphere in a natural process of transpiration. Effluent not taken up by plants will be absorbed into the soil. Although the soil around the area should not be too wet, plants that tolerate moist or wet conditions are best for evapotranspiration systems. Most district and regional councils provide lists of suitable plants.

5.2.11 Gravity soakage trenches/beds are only installed with septic tanks and work well in reasonably flat, well draining soils.

5.2.12 Perforated dose lines 100 mm in diameter are laid in trenches or beds filled with free-draining aggregate and covered with topsoil. Effluent trickles through the aggregate into the surrounding soil (Figure 5).

5.2.13 A common problem with sloping sites is that effluent is not evenly spread over the soakage area. Most of the effluent may discharge at the beginning of the trench, or if trenches are installed with too much fall, most of the effluent will drain to the ends of the trenches. Deeper trenches may reduce the likelihood of aerobic bacterial action.

5.3 SAND/MEDIA FILTER SYSTEMS

5.3.1 Sand or media filter systems provide advanced secondary treatment by trickling septic tank or AWTS

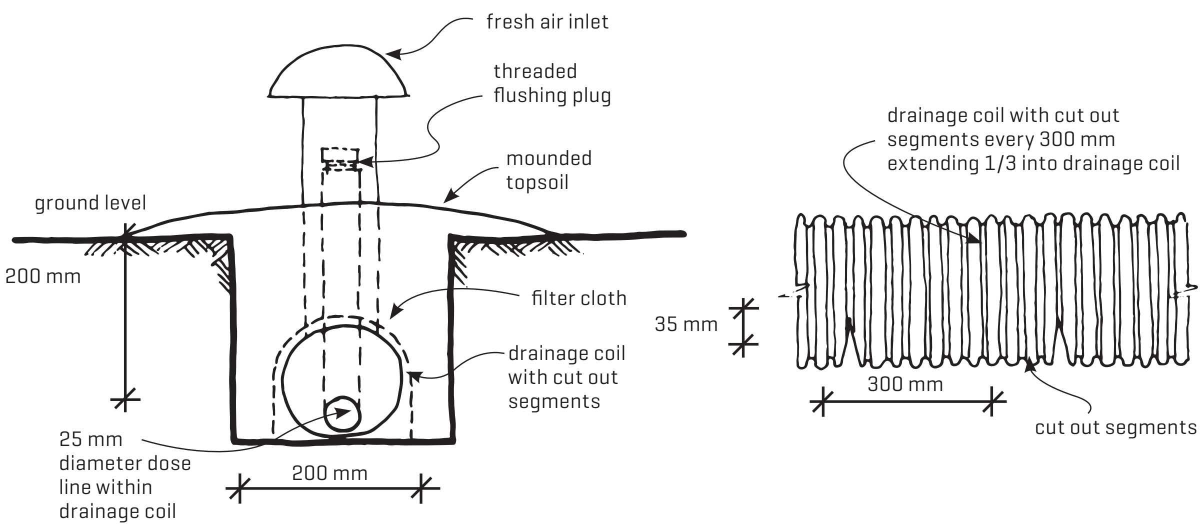

Figure 4. Low-pressure effluent distribution (LPED).

effluent through a filter medium before dispersal to a soakage treatment area.

5.3.2 A filter material is contained in an impermeable lining set in the ground. Effluent is pumped evenly over the filter bed where it is treated by aerobic bacterial activity as it percolates down. It is collected in a slotted underdrain system for discharge to a disposal area (Figure 6).

5.3.3 These systems filter out organic matter and suspended solids and reduce the bacterial count to produce a high-quality, treated effluent. They cope well with fluctuating loadings.

5.3.4 Sand and synthetic textiles are the most commonly used filter materials, but crushed glass, plastic, expanded clay, open-cell foam, extruded polystyrene and ash from coal-fired power plants may all be used.

5.4 RECIRCULATING FILTER SYSTEMS

5.4.1 Recirculating filter systems function similarly to other filter systems but the effluent goes into a recirculation tank before being reaching the filter bed. Once the effluent has percolated through the filter medium, a portion is recycled back to the recirculation tank, while the rest is discharged. Recirculation ratios are around 75–80%. The returned filtrate mixes with and dilutes new effluent before being reapplied to the filter bed.

5.4.2 Recirculating filter beds have a number of advantages over single-pass filter systems:

- They require less area than a single filter system because the effluent can pass through the bed as often as necessary to achieve the required level of treatment.
- There is better control over resultant effluent because recirculation can optimise the treatment.
- There is less odour because influent foulwater is diluted with the return filtrate that has already had partial treatment.

5.5 FACTORS AFFECTING LAND-APPLICATION SYSTEMS

5.5.1 Effluent application should be kept close to the soil surface where oxygen levels are higher and bacteria more active. At least 600 mm of good-quality soil is required below a soakage system to achieve thorough in-soil effluent treatment.

5.5.2 The percolation or design loading rate (DLR), which is the rate at which effluent can be applied, must be correct for the soil's characteristics. If the loading rate is too high, the ground becomes saturated, and the resulting anaerobic conditions slow the rate of treatment. Dry conditions are better for aerobic bacterial action and effluent breakdown.

5.5.3 The long-term acceptance rate (LTAR) is the rate at which a disposal area can treat effluent and is determined by soil characteristics (sandy/rapid draining, silt or clay/slow draining, high water table). Generally, the area for effluent disposal must increase as the loading or percolation rate decreases.

5.5.4 If effluent is not spread evenly across a disposal area, a clogging layer – called creeping failure – will progressively block the trenches. It will continue until there is no soakage capability left and effluent ponds on the surface. Creeping failure can be avoided by:

- improving effluent quality
- lowering the water table
- diverting rainfall and/or shallow subsurface seepage away from the area

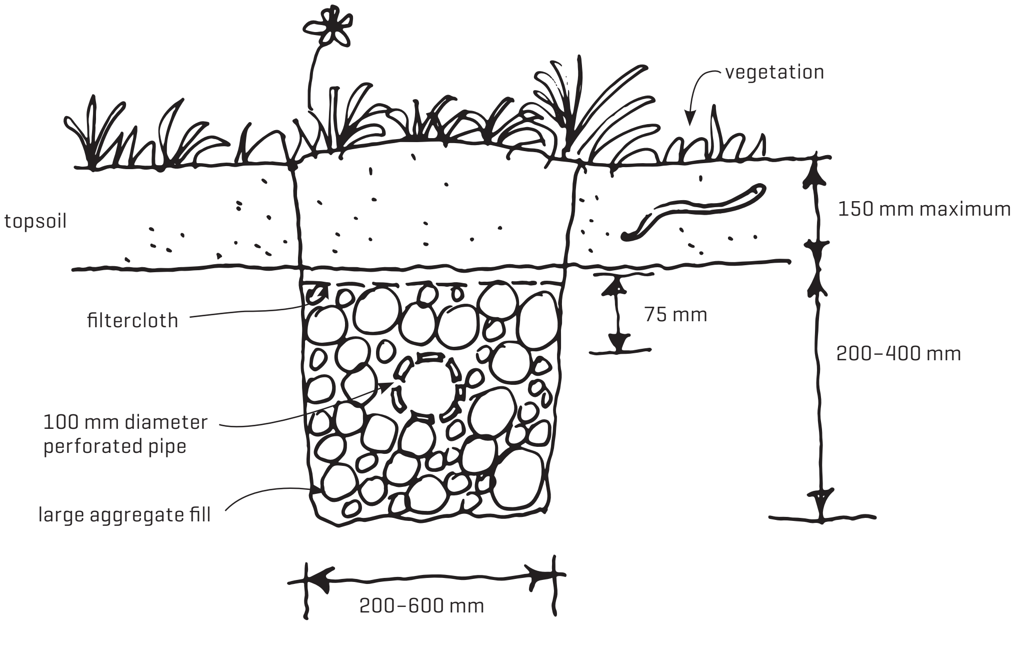

Figure 5. Typical gravity soakage trench.

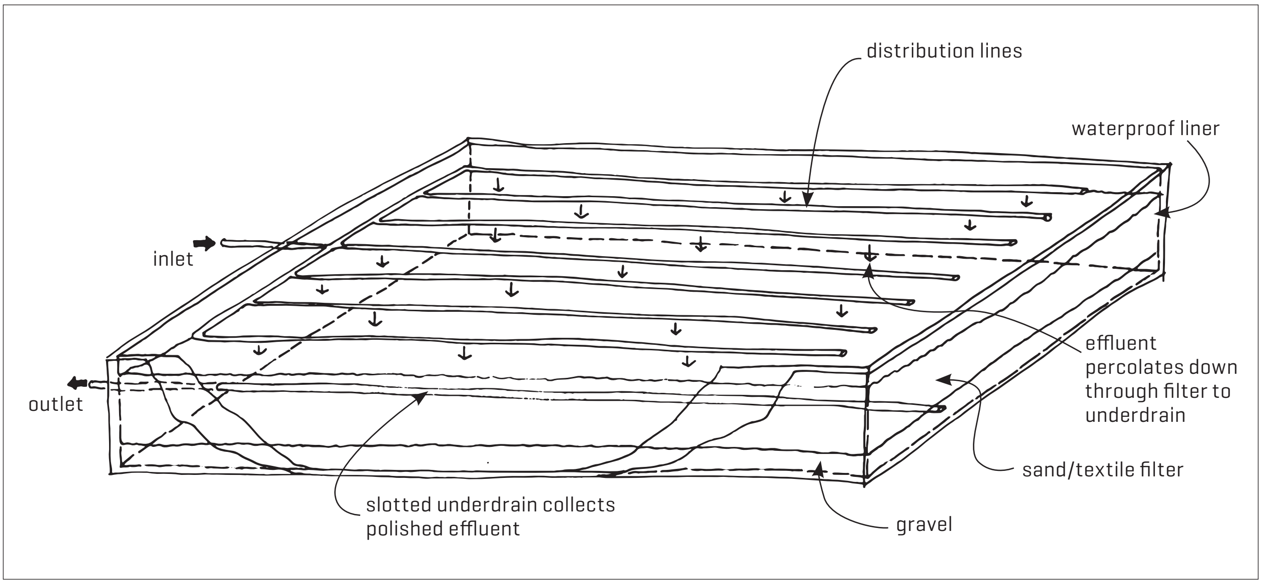

Figure 6. Sand/textile filter system.

- distributing effluent more evenly
- using suitable planting to encourage evapotranspiration
- improving management of loading and resting of disposal areas.

5.6 CONTROLLED DISTRIBUTION

5.6.1 Gravity soakage and LPED trenches or beds should be alternated at least every 3–6 months to give areas a rest and avoid clogging.

5.6.2 The distribution of effluent by gravity supply must be controlled by a distribution box, located between the treatment unit and the land-application system, which directs the flow to different parts of the area (Figure 1).

5.6.3 Some distribution box systems have manually switched baffles. These are not recommended unless the system is managed under a permanent operation and maintenance contract.

6 TERTIARY FILTRATION AND TREATMENT

6.0.1 While a range of tertiary treatment options are available (chlorine, ultraviolet light and ozone treatments together with a variety of purifiers and filters), the reuse of reclaimed water even after treatment is very limited. It should never be used for domestic uses such as cooking, washing vegetables, laundering, baths or showers. There is a high risk of cross-contamination between treated foulwater and potable water systems.

6.0.2 The Ministry of Health strongly advises that reclaimed water (both blackwater and greywater) should not be used where there is any risk of direct human contact (including garden hoses, sprinklers, house washing, swimming pools and above-ground spray irrigation). Many local authorities don't allow water from such activities to drain into natural water bodies.

6.0.3 Reused and disinfected water may be suitable for flushing toilets, subsurface irrigation of gardens (but not root crops) or bush areas and orchards.

7 CONSENT APPLICATIONS

7.0.1 Local authorities will typically require the following types of documentation for a consent application:

- Detailed site plans to scale showing site boundaries, topography, buildings, easements and the disposal field.
- A site and soil evaluation report.
- A detailed system design report with equipment specifications and sizes and disposal field layout.
- Construction drawings of components.
- A producer statement (PS1) from a suitably qualified design engineer to certify that the design complies with clauses B1, B2 and G13.
- Performance tests or certified approvals.
- A resource consent application where applicable.

7.0.2 On completion of the project, the local authority will typically require:

- as-built drainage plans
- a construction producer statement (PS3) by the contractor confirming that the installation has been installed to comply with clause G13
- a construction review producer statement (PS4) by the engineer to confirm that the installation has been installed to comply with clause G13
- a document to show that an agreed maintenance contract has been arranged with a suitably qualified contractor.

8 MAINTENANCE

8.0.1 Owners are legally responsible for maintaining their on-site foulwater system in good working order.

8.0.2 All systems need regular inspections and maintenance. Records including dates and notes on actions such as sludge and scum depth measurements, desludging, inspections and remedial actions should be kept and passed to subsequent owners. Local authorities may also require maintenance records to be kept.

8.1 AERATED WATER TREATMENT SYSTEMS/ADVANCED SEWAGE TREATMENT SYSTEMS

8.1.1 AWTSs and ASTSs require service and maintenance checks by a suitably qualified service person, generally at 6-monthly intervals, to ensure the system continues to work properly. In particular, the air pump filter must be regularly cleaned if in a dusty environment. The manufacturers or suppliers generally have a service and maintenance contract that should be taken up when the system is installed to ensure that the system operates efficiently and is serviced regularly. Some require that systems be inspected and serviced at regular intervals for the warranty to remain valid.

8.1.2 There are often simple maintenance steps that owners can carry out using instructions provided by the manufacturer.

8.1.3 Filter treatment beds require regular removal of vegetation and scraping the surface of filter treatment systems. The pressure head at the end of the distribution system should be checked regularly and accumulated solids drained from lines.

8.1.4 The recirculation tank should be checked 1–3 times per year for sludge accumulation and pumped out as necessary.

8.1.5 Submersible pumps used to discharge effluent to the disposal field have a serviceable life of approximately 7–10 years and will need replacing multiple times over the life of the system.

8.2 SEPTIC TANKS

8.2.1 Septic tanks should be inspected annually for levels of sludge and scum. Desludging should be carried out every 3–5 years. As a guide, the tank should be pumped out when:

- the top of the floating scum is 75 mm or less from the bottom of the outlet fitting
- sludge has built up to within 250 mm of the bottom of the outlet fitting.

8.2.2 Outlet filters must be inspected and cleaned regularly (6 monthly).

8.3 LAND-APPLICATION AREAS

8.3.1 Maintenance of land-application areas may include:

- keeping the area clear of deep rooting trees and shrubs, which can block the system
- cleaning and servicing pumps, siphons and filters according to manufacturers' instructions
- flushing drip lines regularly to scour out accumulated sediment
- changing baffles or valves in a distribution system periodically (every 3–6 months) to redirect effluent to alternative trenches or beds
- keeping livestock and vehicles away
- mowing grass and maintaining plants in evapotranspiration areas
- ensuring that surface water drains that are up slope and near soakage treatment areas are kept clear to minimise rainwater run-off into trenches or beds.

9 PROBLEMS

9.0.1 Indicators that a system isn't functioning properly include:

- foulwater odours from the tank or from the land-application area
- effluent and foulwater ponding on the ground or black liquid oozing from the trenches
- sluggish drainage or gurgling sounds in soil pipes or wastes or when emptying fittings such as toilets and hand basins
- the grass is unusually dark green over the land-application area
- soggy ground around the tank
- illuminated warning lights indicating a pump, electrical or mechanical fault.

9.0.2 Some suggestions to pass on to building occupants to help avoid problems:

- Install water-efficient appliances such as restricted flow tapware and front-loading clothes washers.
- Don't allow kitchen waste products (which can be composted separately) to enter the foulwater system.
- Prevent overloading the system by minimising water use or spreading water use over several days.
- Minimise the use of hard detergents and cleaning products and prevent toxic chemicals or drugs from entering the system. Such material will reduce the system's ability to treat effluent by degrading the bacteria.
- Dispose of items such as wipes, condoms, dental floss, tampons and nappies by wrapping and placing in the rubbish – they should never be introduced into the foulwater system. Some systems will also not accept cigarette butts, coffee grounds, cat litter and other kitchen and bathroom items.

10 FURTHER INFORMATION

Plumbers, Gasfitters, and Drainlayers Act 2006

BRANZ

www.level.org.nz/water/wastewater/on-site-wastewater-treatment

MINISTRY OF BUSINESS, INNOVATION AND EMPLOYMENT

Building Code clauses

- B1 *Structure*
- B2 *Durability*
- G13 *Foul water*

Standards

- AS 1546.3:2017 *On-site domestic wastewater treatment units – Secondary treatment systems*
- AS/NZS 1546.1:2008 *On-site domestic wastewater treatment units – Septic tanks*

- AS/NZS 1546.2:2008 *On-site domestic wastewater treatment units – Waterless composting toilets*
- AS/NZS 1547:2012 *On-site domestic wastewater management*
- AS/NZS 3497:1998 *Drinking water treatment units – Plumbing requirements*
- AS/NZS 3500.2:2018 *Plumbing and drainage – Part 2: Sanitary plumbing and drainage*
- AS/NZS 4348:1995 *Water supply – Domestic type water treatment appliances – Performance requirements*

BRANZ

INSPIRING THE INDUSTRY TO PROVIDE BETTER BUILDINGS FOR NEW ZEALANDERS

BRANZ ADVISORY HELP LINES

FOR THE BUILDING INDUSTRY

0800 80 80 85

FOR THE HOME OWNER AND PUBLIC ENQUIRIES

0900 5 90 90

Calls cost $1.99 per minute plus GST. Children please ask your parents first.

BRANZ Find www.branzfind.co.nz

HEAD OFFICE AND RESEARCH STATION
1222 Moonshine Road, Judgeford, Porirua, New Zealand
Private Bag 50 908, Porirua 5240, New Zealand
Telephone 04 237 1170 - Fax 04 237 1171
www.branz.nz

Standards referred to in this publication can be purchased from Standards New Zealand by phone 0800 782 632 or by visiting the website: www.standards.co.nz.

Please note, BRANZ books or bulletins mentioned in this publication may be withdrawn at any time. For more information and an up-to-date list, visit BRANZ Shop online: www.branz.nz or phone BRANZ 0800 80 80 85, press 2.

ISSN 1178-4725 (Print) 2537-7310 (Online)