



# On-site wastewater management

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## ■ Introduction

This fact sheet provides home owners with information about on-site wastewater management. It contains advice about choosing a system and lists the pros and cons of different systems.

## ■ What is on-site wastewater management?

An on-site wastewater management system is a system that treats and then returns wastewater to the environment within the boundaries of the property where it was produced. There are two parts to on-site wastewater management – treatment and disposal.

More than 65,000 houses in the Auckland region are in areas that are not serviced with a sewer network and rely on an on-site wastewater management system.

On-site wastewater management aims to achieve the sustainable treatment and return of wastewater to the environment, while avoiding adverse effects on the environment or public health.

The Auckland Regional Council (ARC) is responsible for administering discharges of contaminants such as wastewater throughout the region and aims to protect its valuable physical and natural resources.

## ■ On-site wastewater treatment systems

There are many different types of on-site wastewater treatment systems, each providing different levels of treatment. The level of treatment includes:

- Primary treatment, such as from septic tanks
- Secondary treatment, provided by aerated wastewater treatment systems (AWTS)
- Advanced secondary treatment systems, includes textile filters and sand filters.

Secondary and advanced secondary treatment systems are often supplied as a ready made package plant.

Wastewater flows from the house to the wastewater treatment system. The treatment system uses physical and biological processes to reduce the level of contaminants in wastewater discharging it into the ground.

Physical treatment processes include the gravity settlement of solids and the filtering of wastewater to remove suspended solids. Biological treatment occurs through the digestion of wastes by bacteria. Bacterial breakdown can be an anaerobic process (without air), such as within the septic tank, or an aerobic (in the presence of air), such as within an aerated treatment plant.

## ■ Septic tanks

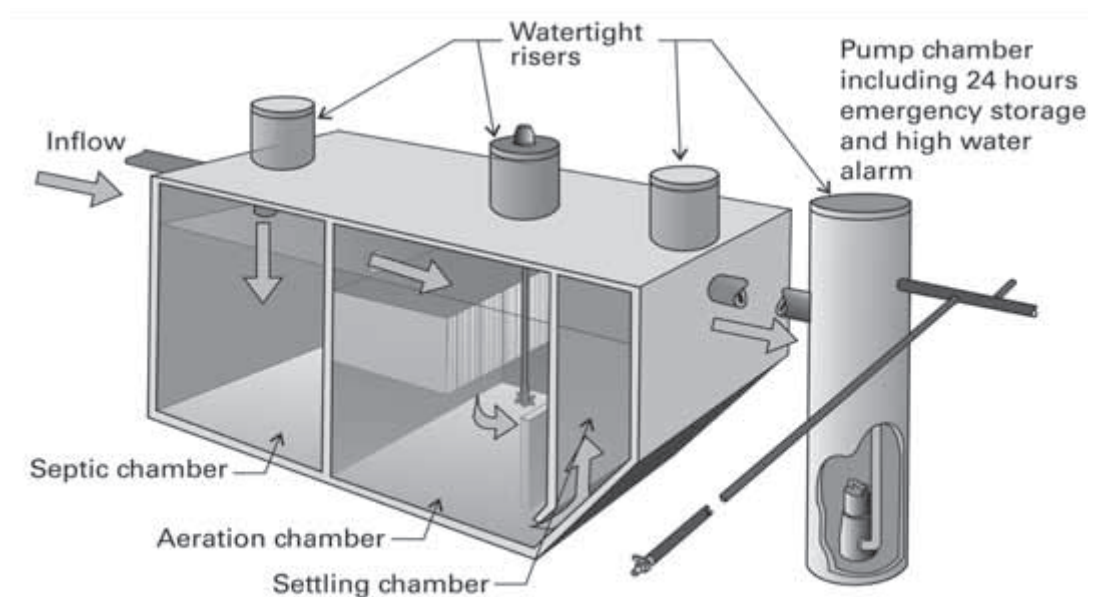
Septic tanks provide a basic level of wastewater treatment. They may be installed to receive wastewater flows before a secondary system or they can be included as a primary treatment chamber within a package treatment plant.

See the ARC fact sheet, “On-site Wastewater Management – Septic Tanks” for further information.

## ■ Aerated wastewater treatment systems (AWTS) – secondary treatment

These systems use air pumps and blowers to create conditions for the growth of aerobic bacteria. A disc filter must be installed to reduce the level of solids within treated wastewater from AWTS.

Schematic picture of a typical Aerated Wastewater Treatment System (AWTS) (Source: TP58, 2004)



### Benefits of AWTS systems:

Significantly better quality treatment than septic tanks.

### Disadvantages:

Because of the operation of air pumps or blowers, it may cost more to run AWTS than other types of wastewater treatment system.

Aerated wastewater treatment systems may not operate well under fluctuating or intermittent wastewater flows

## ■ Textile filters and sand filters – advanced secondary treatment

These systems use either synthetic textile or sand as a media to provide a high surface area for the growth of aerobic bacterial colonies. They provide a better level of treatment than aerated treatment systems.

### Benefits:

- A relatively high level of wastewater treatment
- May be suitable for sensitive environments
- May have lower running costs than AWTS

### Disadvantages:

- Sand filters may have a larger footprint than other systems
- Rainwater may enter sand filters and affect performance



## ■ Choosing a wastewater treatment system

The ARC recommends that property owners engage a suitably qualified wastewater engineer or wastewater consultant to provide site specific on-site wastewater management system advice and designs.

Listed below are questions to ask system suppliers and wastewater consultants or engineers before choosing an on-site wastewater management system:

### ■ **Is the treatment system suited to the type of dwelling?**

Some wastewater systems may not be well suited to use with holiday homes or in situations where wastewater flows frequently fluctuate.

### ■ **What level of wastewater treatment is necessary for the property?**

The presence of surface waters or stormwater drains near the site may result in a need for a higher level of treatment.

### ■ **What are the maintenance requirements of the system?**

The ARC requires that all systems are serviced on at least a six-monthly basis, but there may be on-going day-to-day maintenance requirements.

### ■ **Does the system come with a warranty or guarantee?**

### ■ **Is the system designed to treat the amount of wastewater that will be produced by the dwelling?**

### ■ **What are the running costs of the system?**

Some systems have higher on-going costs/power consumption.

### ■ **What wastewater disposal system is best suited to the property?**

### ■ **Can it be installed beneath lawn or within planted areas?**

Some disposal systems may be better suited to certain environments – the ARC recommends pressure compensating drip irrigation is used as it is versatile and more reliable than other systems.

### ■ **What happens in a power cut?**

The ARC recommends on-site wastewater treatment systems provide at least 24 hours emergency storage.

## ■ On-site wastewater disposal systems

### ■ Pressure compensating drip irrigation lines (PCDI)

The ARC recommends that pressure compensating drip irrigation systems be used where possible. Treated wastewater is pumped in doses from the treatment plant to the PCDI system, which is installed just below the ground surface.

The benefits of this system include:

- Targeted wastewater disposal
- Wastewater is applied to the near surface topsoil, where additional polishing treatment of the wastewater may occur
- Near surface application of wastewater can result in greater rates of evapotranspiration – removal of the wastewater by wind, sun and plant transpiration
- Ease of repair – drip irrigation systems are more easily fixed than other systems (e.g. trenches) which often need full replacement in case of failure
- Increased versatility

Dripper lines can be installed on the ground surface within existing gardens or bush areas or under the ground beneath lawns

Unlike other wastewater disposal systems, pressure compensating drip irrigation lines do not need to be installed level and can function on slopes.



## ■ Other wastewater disposal systems

These may be appropriate for some situations, and include trench and bed disposal systems. The use of these types of systems may be limited by the type of soils on the site and these methods may not be appropriate in areas with slow draining clay soils.

## ■ For more information

The ARC has a range of fact sheets about on-site wastewater management. Copies are available online at [www.arc.govt.nz](http://www.arc.govt.nz) or upon request. Topics include:

- Septic Tanks
- Treatment and Disposal Systems – Maintenance and Trouble Shooting
- Consent Compliance
- Post Construction Information

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