Waste Control Systems Information Sheet

Are you considering one of the following?

- Purchasing a house
- Own a house and want to upgrade the waste control system
- Planning to build additions to your existing home (including new wet areas) or
- Purchasing a vacant block and/or building a new home.

The Clare & Gilbert Valleys Council region is not on a sewer system like the Adelaide metropolitan area. The townships such as Clare, Riverton and Saddleworth have a Community Wastewater Management System (CWMS) whilst the remaining properties have (or require) on site wastewater systems.

This information sheet is designed to provide general comments on wastewater disposal issues for your consideration. Please speak to Council's Environmental Health Officer for further information, however in some instances definite opinions, consents or approvals cannot be given without first lodging the necessary application(s).

Purchasing an existing house
Ask the Real Estate Agent (or owner) if the property is connected to community wastewater management system or an independent on-site wastewater system. The agent might be able to answer some of these questions but check this fact sheet (or contact Council).

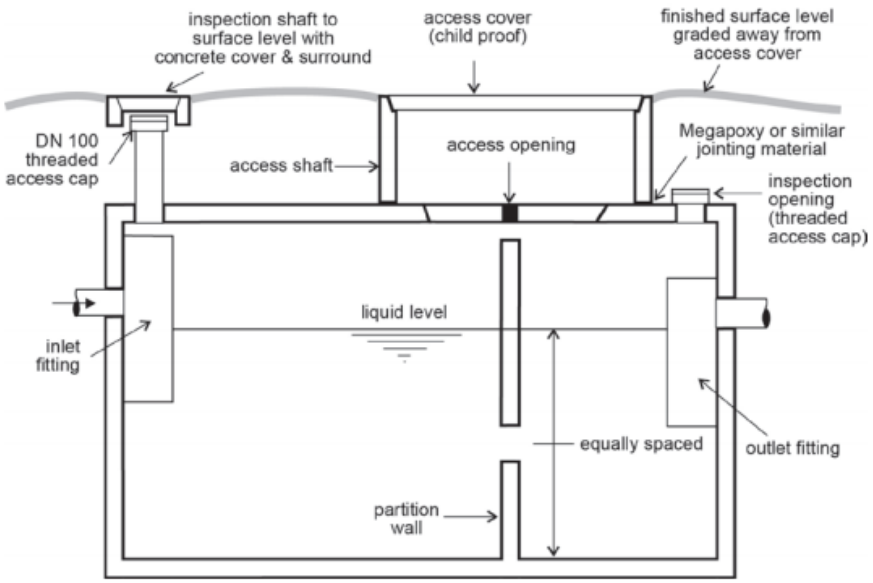
There are existing homes with wastewater systems that are failing to operate in a sanitary condition. Sometimes the remedy is simple, for example replacing missing lids, vent caps, or education on better maintenance can ensure the wastewater system will give many more years of satisfactory service.

Types of wastewater systems.
Community Wastewater Management System (CWMS)
With CWMS the wastewater generated on each site is collected into a septic tank. The solids settle and remain in the septic tank. They need to be pumped out by a licensed liquid waste contractor on average every 4 years. The wastewater is piped off-site through the CWMS network to a treatment plant**.**

If CWMS is available (or can be made available) to your block, connection will be mandatory for any new house (and/or commercial development).

A 3000 litre septic tank with approved riser (lid) fitted.

Below: Typical horizontal septic tank design



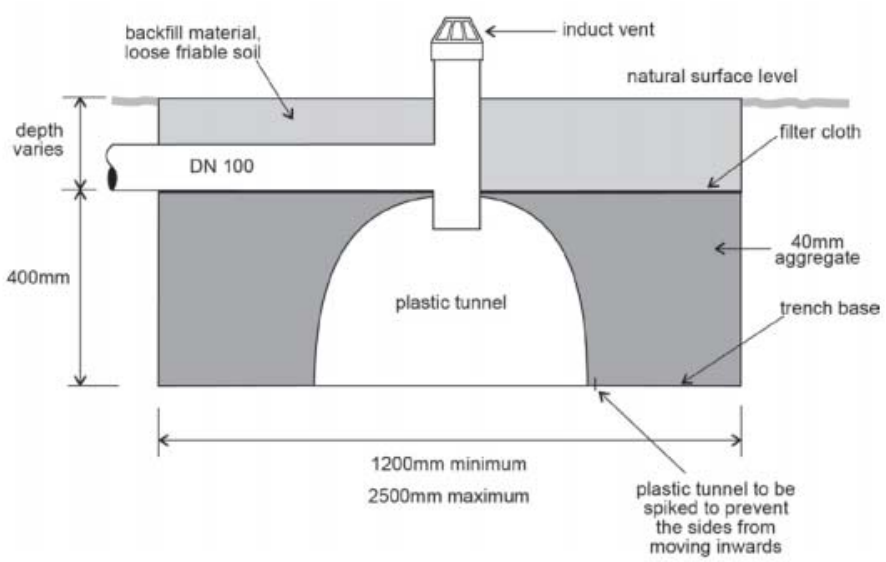
Septic Tank and Soakage Trench System

This is an elementary form of sewage and wastewater treatment. The tank receives all sewage and separates the solid portion of the waste from the liquid portion. The liquid portion (contaminated effluent) passes out of the tank into the subsurface trench or other approved system where it soaks into the soil. Bacteria within the tank break down waste into simpler substances. Sludge and scum accumulate over time and the tank must be pumped out periodically (every 4 years minimum) to prevent these solids entering the trench and causing clogging.

Soakage trench showing plastic tunnel and aggregate (stone).

Soakage trench showing filter cloth (geotextile) prior to back filling with top soil.

Below a cross sectional diagram of a subsurface effluent soakage trench.



Aerobic Wastewater Treatment Systems (AWTS)

These can be used where conventional subsurface disposal methods are ineffective. AWTS incorporate primary treatment, aeration, clarification, settling, disinfection and storage chambers. The resulting effluent is discharged by pumping to a **dedicated** surface or sub-surface irrigation disposal area. The land used for the irrigation area cannot be used for recreational purposes and needs to have signs erected advising

'Warning—recycled water not suitable for human contact/consumption'.

PLEASE NOTE THAT THIS WASTEWATER IS NOT SUITABLE TO USE FOR WATERING LAWNS OR VEGETABLE GARDENS.

Surface Irrigation Disposal Area

Treated effluent is disposed of via an irrigation system, which is set up in a designated effluent irrigation area which must be landscaped, mulched and planted with suitable nutrient tolerant plants. The plants facilitate the uptake of nutrients and absorption of the wastewater. Moderately salt tolerant non- food plants should be selected for planting within the area. It must be ensured that the area is dedicated to the sole use of receiving reclaimed effluent and should be designed to discourage pedestrian and vehicle access.

Dedicated surface irrigation area prior to the 150mm of mulch being applied.

The average size for a dedicated irrigation area is 200m² for a 3 bedroom home.

Service Requirements for Aerobic Wastewater Treatment Systems (AWTS)

An aerobic system needs to be serviced quarterly by a qualified technician. They will make sure the system is still operating effectively and repair/replace any parts that are blocked (e.g. sprinkler/dripper heads). The technician will also replace the chlorine tablet (used in many models) to ensure the wastewater is being disinfected to reduce bacterial load. This reduction in bacterial load makes the wastewater suitable for disposal to the dedicated irrigation area.

Failure to service the aerobic system results in greater risk to health as the wastewater would be of a poorer quality. Contact with untreated wastewater results in exposure to microorganisms that can cause disease.

The above picture shows under construction a secondary treatment system (e.g. aerobic) with sub-surface disposal area where the wastewater is disposed of through a buried dripper system that waters your lawn from underneath

LPED (Low Pressure Effluent Distribution)

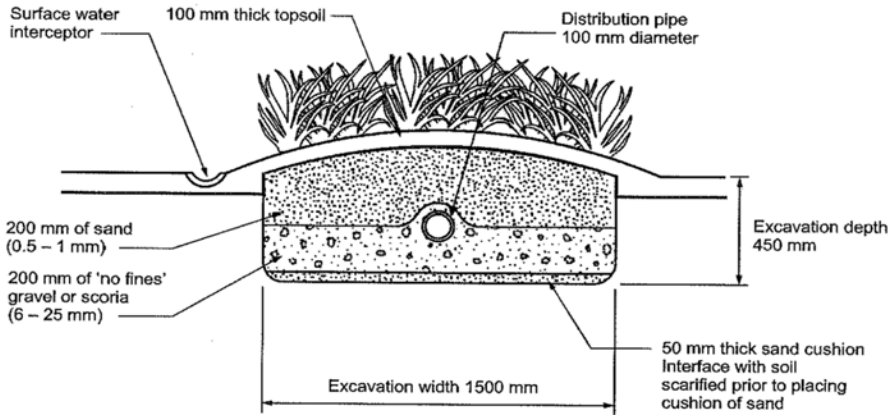
LPED nests the pressure line inside a (typically) 100mm slotted drainage coil line (or perforated PVC drainage pipe) so that squirt hole discharges splash up against the internal walls of the enclosing distribution line and spread along that line between squirt holes. This disperses effluent along a much greater portion of the trench base than achieved by the spot loading of the un-nested dose line, thus achieving more effective contact with and use of the infiltrative surfaces of the soil in the trench system.

LPED (Low Pressure Effluent Distribution) The picture below on the left shows the system being tested

Evapo – transpiration Absorption System (ETA)

Evapotranspiration absorption (ETA) beds reduce reliance on effluent absorption into the soil by maximising water loss through evaporation and transpiration.

Effluent is distributed through the bed by a system of slotted pipes. Capillary action draws effluent up from a lower gravel bed through sand to supply the root zone of vegetation (usually grass) on top of the bed, to optimize evapotranspiration.



Evapo – transpiration Absorption Bed (ETA) being installed.

Evapo – transpiration Absorption Bed (ETA) being installed.

Pressure Dosed Filtration Trenching

Alternating the wastewater stream over a number of trenches is another design improvement that achieves greater uniformity of flow across the dispersal area to assist in maintaining unsaturated and therefore aerobic conditions within the trench network. This helps to maintain naturally aerobic conditions within trenching system to minimize odour and limit the development of the clogging mat over the soil interface. It also allows time for the soil to recover and re-aerate prior to the next dose. Plantings (eg lawn) should always be considered to encourage evapotranspiration to assist in drying out the soil and promote aeration and biological treatment of the effluent and that pressure dose loading ensures even distribution throughout the design area.

Pressure Dosed Filteration Trenching prior to being covered with top soil.

Reed Beds

A reed bed is essentially a basin that is lined with an impermeable membrane, filled with gravel and planted with macrophytes such as reeds and rushes (See Diagram below). Wastewater (black or grey) passes through the root zone of the reeds where it undergoes treatment via physical, chemical and biological interactions between the wastewater, plants, micro-organisms, gravel and atmosphere.

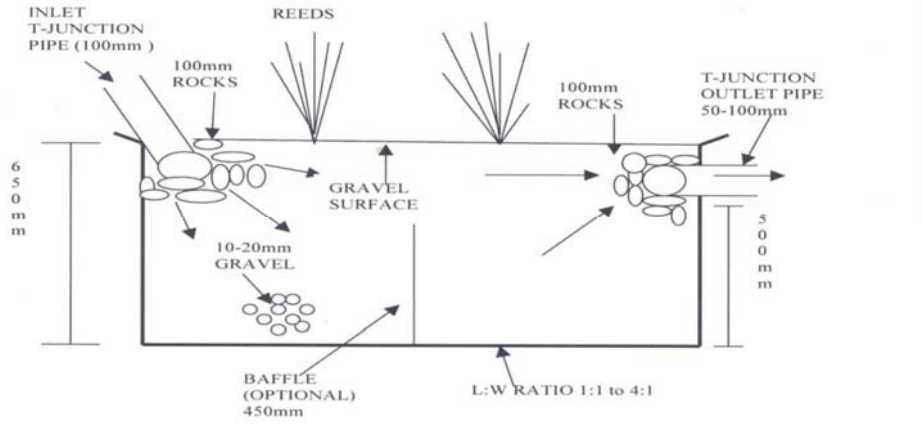
Inlet and outlet pipes are positioned below the gravel surface, so that the water always remains below the surface, thus minimising the risk of human exposure to the wastewater, mosquito breeding and unpleasant odours.

How do Reed Beds Work?

Raw wastewater from the house flows into a septic tank for primary treatment to remove large solids, grease and oils. The partially clarified effluent from the septic tank passes through an effluent filter to trap any large solids that remain, and then flows into the reed bed. Once inside the reed bed, the wastewater undergoes a complex series of natural treatment processes as it moves laterally through the root zone from one end of the bed to the other. The wetland plants leak small amounts of oxygen out through their roots, creating small oxygenated sites within an otherwise anaerobic environment. This mix of aerobic and anaerobic conditions creates an ideal environment for the growth of micro-organisms on the surface of the gravel and plant roots. These micro-organisms are largely responsible for the pollutant removal that occurs in a reed bed, as they feed on and breakdown organic matter and nutrients, and compete against pathogenic organisms. Earthworms have also been found to inhabit reed beds, and assist with the breakdown of organic matter and solids.

Most of the pollutant removal processes in reed beds are time dependent. Reed beds are generally designed to detain the wastewater for a period of 5 to 7 days in order to allow sufficient time for the settling and filtering of suspended solids, breakdown of organic matter, binding of some contaminants onto the gravel, and removal of nutrients by plants and micro-organisms.

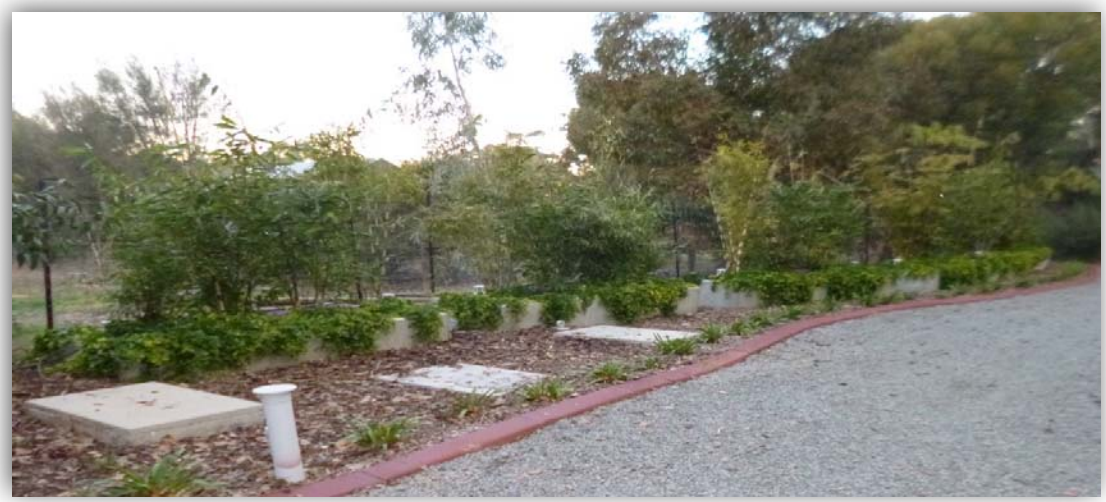
Basic Reed Bed Design (Lateral View)



Rhizopod ® System

The Rhizopod system is fundamentally an extension of a temporary containment system. All existing approval conditions as required under the Waste Control Systems Code for temporary containment systems including, high level audio/visual alarm, maintaining accessibility by tanker truck and a formal contract in place with an EPA licensed liquid waste contractor are required. Waste from the holding tank is recirculated through a series of concurrently dosed concrete Rhizopod structures with return drains connected back into the holding tank system. The configuration continues to serve as a holding tank system should the inflows exceed evapo-transpiration rates whereupon the high level alarm would eventually signal alerting for the need to decant holding tank. Mature vegetation canopies can significantly reduce the frequency of off-site disposal activity.

Below – photos of the Rhizopod System in stages of being installed.



An established Rhizopod system.

Purchasing a vacant block and/or building a new home.
If you're building a new house (or purchasing a vacant block with the intention to eventually build a house) you need to consider waste (sewage) disposal.
If CWMS is available (or can be made available) to your block, connection will be mandatory for any new house (and/or commercial development).
If your block doesn't have CMWS available then an on-site system is the only solution - providing it can meet State Health requirements. Compliance with these legal requirements is established after a "wastewater works application" is lodged with the Council.

How do I decide which system is best for my site?
You will need to engage a wastewater engineer to assess, design and certify a wastewater system for your site. They will arrange for soil samples to be taken and produce a wastewater engineer's report detailing key issues for your site.

The following criteria must be evaluated when considering an on-site system eg
Land slope - not greater than 20% (1 in 5) or site engineering solution required.
Flooding - the site should not be subjected to inundation or flooding more frequently than 1 in 10 years.
Site and soil characteristics - assessed for depth and permeability.
Setbacks – minimum distances from buildings, boundaries or swimming pool and importantly 50m from watercourses (rivers, creeks, dams, bores etc).
System size and capacity – number of potential occupants (min 6) and sanitary fixtures.
The wastewater engineer will recommend what they believe is the most suitable wastewater system for your site.
You need to apply to council to approve the installation of your chosen on-site wastewater system.
Copies of the wastewater works application form are available on the Clare & Gilbert Valleys Council 'Planning & Development' webpage.
You will need to pay the application fee and submit: 1) the completed wastewater works application form, 2) a detailed site layout plan, 3) a detailed building layout plan, and 4) the site and soil report produced by a qualified wastewater engineer. Please note that all plans will need to be signed by the property owner.
The council's environmental health officer will assess your wastewater works application. The Officer will identify any issues of concern and will contact the applicant to discuss the issues. The Officer will request any additional information or alterations that are needed to the design. Once these issues have been resolved and council's officer have received all the information required, the approval of your application can finalised. **The approval process can take several months depending on how quickly all the necessary information is provided to council.**

A licensed plumber will be required to install your on-site wastewater system. As the effluent is not suitable for human contact the effluent irrigation areas must be installed to as to comply with designing engineers site and soil report.

THE IRRIGATION AREA MUST BE INSTALLED BY A LICENSED PLUMBER.