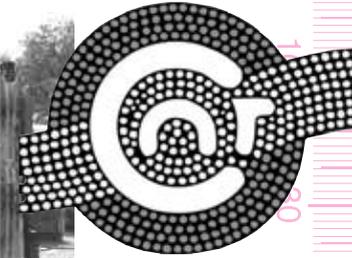


# BUSH TECH # 15

## Choosing the right toilet



This BUSH TECH is about how to choose a toilet system for a small, remote community or outstation.

A system for managing human waste safely is an essential service. Human waste (faeces, poo, shit) contains many pathogens; that is, micro-organisms that can make people sick. So keeping human waste away from people is very important. Human waste also can pollute the natural environment, which can affect bush tucker and other living things, as well as other people.

Small, remote Indigenous communities have particular characteristics that should be kept in mind when choosing a toilet technology. For example, the community may have a changing population, and may be unoccupied for part of the year. At other times, houses may be very crowded. The community may have no electricity or an unreliable supply. Water may be limited. The community may be remote from town services and it may be difficult to get tradespeople and people with special skills to the site. People may have cultural needs to consider.

A range of technologies is available for managing human waste. These all have advantages and disadvantages, depending on where they are to be used. This BUSH TECH compares four main types of toilet technology.

There are laws about what type of toilet can be used in various locations, and laws about the design and installation of toilets. These laws vary from state to territory and you will need to talk to your local council and health authority.

### The choices

Four basic types of toilet systems are compared here: pit toilets, septic tanks, composting toilets and aerobic wastewater treatment systems (AWTSs). There are other technologies, and many variations on these designs but these four basic types are a good place to start.

### Pit toilet

A pit toilet is simply a hole in the ground over which a toilet pedestal and shelter are placed. The pit may be lined to stop it caving in. Some anaerobic decomposition of waste takes place in the pit. When the pit is full it needs to be covered over and a new site found. The VIP latrine (Ventilated Improved Pit Latrine) has a ventilation pipe in the pit to draw away odours. The vent pipe also acts as a flytrap.

Pit toilets are easy and cheap to build. They are very reliable and require little or no maintenance. No water or electricity is



required. Pit toilets are suited to variable populations and intermittent use. They usually smell a bit.

The waste is not fully contained, so pollution of the environment does occur, especially in areas with a high water table, or close to streams. Waste also can be dispersed if the pit overflows due to flooding.

Pit toilets cannot be used for treating 'greywater', so, where pit toilets are used, a separate disposal system will be needed for water from the kitchen, bathroom and laundry.

### Septic tank

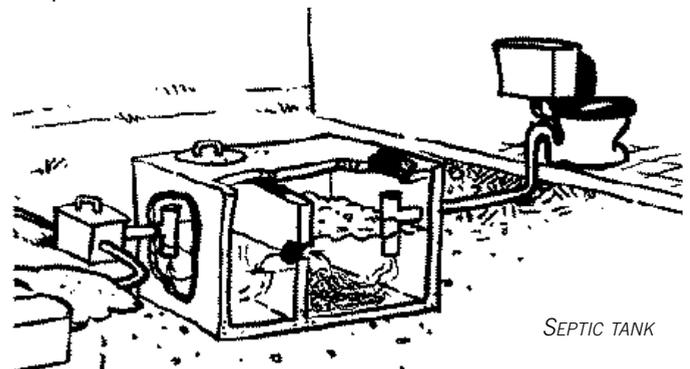
A septic tank is a common disposal method used with flush toilets. Waste mixed with water flows to a large tank, which usually is buried in the ground. The waste settles and decomposes anaerobically in the tank. Partially treated waste flows out of the tank into disposal trenches that spread the waste out into the soil. Most septic tank systems are designed to treat waste from one household but larger systems for several households also are available. Septic tanks work fine with intermittent use.

Septic systems require a reliable water supply and a suitable area of land for treated waste disposal. Soils with high clay content, and areas with a high water table are not suited. A skilled tradesperson (plumber) is required to install a septic tank system and the tank needs to be emptied by a special disposal truck, sometimes as often as once a year. Even if it is not emptied, the tank needs to be inspected every year.

Some people like flush toilets because they carry the waste away from houses and people, and don't smell. However the toilet and the pipe that carries the waste to the septic tank can easily become blocked if the wrong materials are put down the toilet. A blocked toilet or pipe is a serious health hazard and a skilled person may be required to fix it. The toilet will not work at all if there is no water supply. Septic tanks and trenches can overflow if the amount of waste is a lot more than usual; for example if a house is very overcrowded or if taps are left on accidentally and a lot of clean water runs into the tank.

The waste that comes out of a septic tank into the disposal trenches still contains pollutants that can get into groundwater and streams.

Septic tanks can be used for the disposal of greywater as well as toilet waste. However, best practice is to have separate tanks and disposal trenches.



SEPTIC TANK

### GLOSSARY

**Micro-organisms** – small creatures that are present in the environment all around us. They include bacteria, protozoa and many others.

**Aerobic** – means 'with air'. Aerobic micro-organisms live in conditions where air is present.

**Anaerobic** – means 'without air'. Anaerobic micro-organisms live in conditions where there is no or little air.

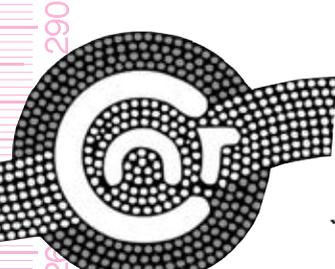
**Greywater** – means dirty water from the kitchen, bathroom and laundry.

**VIP latrine** – the Ventilated Improved Pit Latrine is produced in the CATWorkshop. For information, phone (08) 8951 4311.

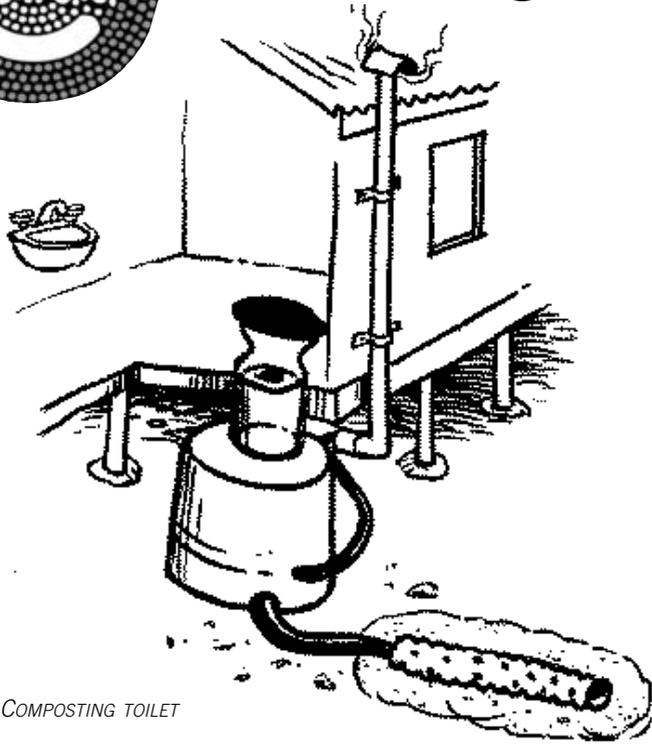
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# BUSH TECH # 15

## Choosing the right toilet (continued)



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COMPOSTING TOILET

### Composting toilet

A composting toilet uses an aerobic composting process to convert waste into a final product that looks like soil. A composting toilet is a dry toilet. No water is used to carry the waste away. The waste is deposited in a chamber where micro-organisms decompose it into compost. This works best if the material in the chamber is kept dry and well ventilated, so there is usually a drain to remove excess liquid, and a ventilation system to keep lots of air moving around the compost pile.

It takes up to a year for waste to fully decompose into compost. The compost is then safe to handle and can be used as fertiliser in the garden (but not where there are plants that are eaten).

There are lots of different designs for composting toilets. Some can be purchased as kits and others can be built using readily available building materials. Designs are available to suit one or several houses, and intermittent use is OK. Some designs use an electric fan for ventilation and so they require an electricity supply. If the electricity supply or the fan breaks down, the composting process doesn't work as well, and the smell can be strong.

All composting toilets have to be checked at least once a week to make sure they are working well. Many require dry material such as leaves or shredded paper to be added to the chamber to improve the composting process. It is also important not to put material down the toilet that will not compost, or toxic chemicals that will kill the micro-organisms that do the composting. All composting toilets need to be emptied from time to time. Some people find this difficult because it means handling material that used to be human waste.

Composting toilets cannot be used for treating greywater.

### Aerobic Wastewater Treatment Systems

Aerobic wastewater treatment systems (AWTS) are like miniature sewage treatment plants. These work with waste that is mixed with water, so they are used with flush toilets. The main process they use to treat waste is to pump air through the waste, so that the waste is broken down by aerobic micro-organisms. The

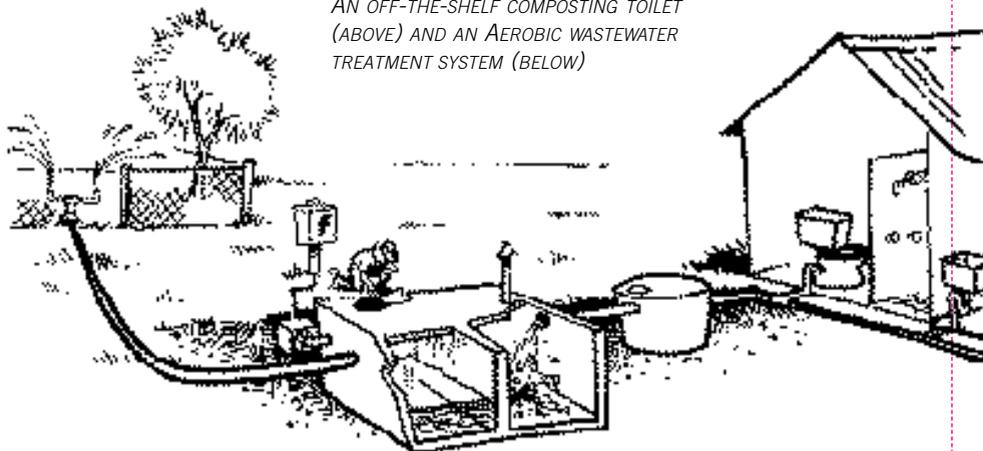
treated waste can be disposed of in underground trenches (as with a septic tank) or sometimes it can be used for irrigation of garden beds, although there are legal restrictions on how you can do this.

The treated waste that comes out of an AWTS has much less pollution in it than the waste that comes out of a septic tank. An AWTS can be used to treat greywater.

AWTSs are complicated pieces of equipment. Most designs include a number of pumps and fans. A specially trained technician is needed to install the system and to do regular maintenance. Some local government laws require them to be serviced by a technician every three months. These systems also need a constant electricity supply. If the electricity supply stops, or if one of the pumps breaks down, the system can overflow.



AN OFF-THE-SHELF COMPOSTING TOILET (ABOVE) AND AN AEROBIC WASTEWATER TREATMENT SYSTEM (BELOW)



Careful consideration of a range of factors is needed when deciding what type of toilet system is best for a small, remote community. The information presented here is a starting point. Please telephone the Centre for Appropriate Technology in Alice Springs (08 8951 4311), Cairns (07 4031 0505) or Derby (08 9191 2585) to discuss your particular situation.

Prepared by Michael Martin  
CAT Cairns  
Illustrations by Tom Cosic