

OPERATION AND MANAGEMENT OF AN ON-SITE WASTEWATER SYSTEM

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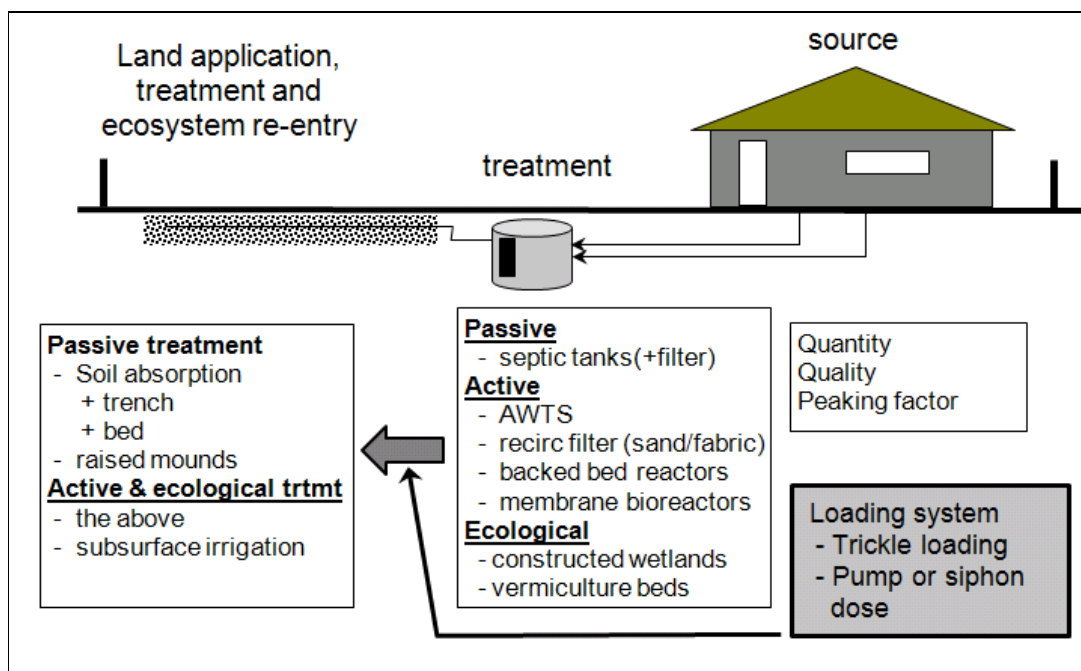
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WHAT ARE THE COMPONENTS OF YOUR DOMESTIC WASTEWATER SYSTEM

As illustrated in Figure 1 there are four key components of an on-site domestic wastewater system, namely;

1. The wastewater source component, i.e. the dwelling and the type of wastewater producing facilities (toilet cisterns, shower heads, washing machine(s) and other possible facilities such as spa baths), the occupants and their behaviour (i.e. what is flushed and type of household products used (cleaning agents));
2. The treatment plant – which may be a simple septic tanks or a more complicated package plant;
3. The land application loading component; which may be as simple as trickle loading, or it may be dose loading to the field using a pump, siphon or flout mechanism;
4. The land application component; which not only returns the treated wastewater to the local ecosystem but also very often provides additional treatment of the wastewater stream.

Figure 1. Components of an on-site domestic wastewater treatment systems.



Taking care of your wastewater management system means recognizing and understanding all four components of the total system and, as home-owner and/or home occupier, applying basic care and responsibility towards the operation of each of these components.

A failed or failing wastewater system is not only a health risk to the occupants, and possibly neighbours, but also can cause nuisance odours, ponding and can be costly to fix.

The purpose of this technical fact sheet is to assist home occupiers to take good care of their on-site wastewater management system.

A DOMESTIC WASTEWATER SYSTEM IS (IN MOST CASES) A LIVING ECOSYSTEM.

There are millions of different types of little organisms living in your wastewater treatment system – whether it be a simple septic tank or a more complicated package plant. These little organisms work 24/7 and get no holidays or dirt money. Their mission; to clean up your wastewaters before being discharged into the natural ecosystems around your home. These organisms have been around for billions of years closing nutrient cycles and sustaining life on this planet – so they do know what they are doing and are well adapted. Ask the designers and manufacturers or your treatment system how well they understand the ecology of their system and the effort made to ensure optimum working conditions for the critical work that these organisms do for our benefit.

The wastewater streams that these little organisms clean up for us are blackwater (wastewater that comes from toilets) and greywater (wastewater that comes from the washing machine, showers, baths, kitchen sinks and other sinks in our home). Blackwater and greywater contain many constituents, that if not cleaned up properly, are a risk to our health and to the natural ecosystems we live in. They contain disease organisms that can cause us to become very sick. These include, for example, viruses (e.g. *Hepatitis*), bacteria (e.g. *Salmonella*, *Shigella*, *Campylobacter*), protozoa (e.g. *Giardia*, *Cryptosporidium*) and helminthes (worms (e.g.. *Schistosoma*, *Ascaris*). Domestic wastewater also contains a number important nutrients (e.g nitrogen, phosphorous, potassium) and some of these, if no well managed, can upset the ecological balance in streams and the lagoon if discharged in large quantities. These nutrients may also be a risk to human health if they contaminate our drinking water supplies. At the same these nutrients are a critical resource for the production of food and fibre.

There are some constituents in your domestic wastewater that the little wastewater cleaners like and there are some constituents they are not so keen on. There are also constituents that they definitely do not like, as they are toxic to them and will kill them if released in large enough doses. If too many toxic materials are flushed down the drains that lead to the wastewater system the little cleaners will die, the treatment plant will fail, the land application system may also fail and clog up, and the ecosystem around your home will become a major health risk.

WHAT DO THE ORGANISMS IN YOUR WASTEWATER MANAGEMENT SYSTEM LIKE?

The little organisms living the system like natural body wastes – although if you are on heavy medication such as antibiotics over a long period of time this can cause them some problems. They are really happy if you use environmentally friendly (biodegradable) soaps, shampoos, laundry powders and liquids and household cleaning products.

WHAT ARE ORGANISMS NOT SO KEEN ON?

Excessive volumes of wastewater can flood the treatment unit and land application field. These excessive volumes may come from within the house or from flooding outside when it rains heavily. Typically each person produces between 160 and 200 litres of wastewater each day from within their house. Most systems are designed to handle this quantity – but when this volume is exceeded it can become a problem for our little workers in the system.

Hints:

- 1) Keep showering time short;
- 2) Don't leave taps running;
- 3) Don't empty large containers of wastewater into the drains;

- 4) If you have a spa bath you should increase the capacity of your septic tank to cope;
- 5) Make sure that gully traps, treatment tanks and pump chambers are well sealed so that stormwater will not enter into them.

Laundry detergent - avoid using more than the necessary amount of powdered and liquid laundry agents or dishwasher detergent. Excessive amounts of powdered laundry detergent often fail to dissolve in the washing machine. Using low phosphorous washing powders is not only better for the treatment plant, but also for the land application field and natural environment.

Small quantities of household cleaning, detergents, fabric softeners, shampoos, and bath soap, at *normal* levels of household use, are sufficiently dilute when they reach the septic tank so they should not be a problem for most wastewater systems.

Normal quantities of water used to mop a floor or clean a bench, are unlikely to damage the wastewater system.

Note also that kitchen insinkers can overload some treatment units with organic matter and should not be installed. However if using a vermiculture treatment filter, these normally can breakdown insinkers wastes very well.

Normal use of antibiotics in a home will be tolerated by our little micro-organisms but high levels of discharge of antibiotics in urine and body waste can kill them or make them very groggy.

Hints:

- 1) Use a scoop or measure when adding laundry detergent to your washing machine;
- 2) Apply household cleaners using pumps or sprays and use minimal quantities;
- 3) Before installing a kitchen insinkerator, check the capability of the treatment plant to process insinkerator wastes;
- 4) If possible, dose your treatment unit with suitable micro- and macro-organisms when someone in your household has been taking antibiotics for extended periods;
- 5) When possible, use biodegradable household cleaners and low phosphorous laundry detergents.

WHAT MUST NOT BE FLUSHED DOWN DRAINS LEADING TO THE WASTEWATER SYSTEM?

Don't flush down the toilet or wastewater drains the following; nappies, chemicals (acids and alkalis), caustic compounds (caustic drain cleaners), paints, thinners, varnishes, pesticides, motor oil, excessive fats, cooking oils and greases, large quantities of detergents, disinfectant and antiseptic liquids, cigarette butts, coffee grinds, large quantities of dirt, drugs and pharmaceuticals, kitty litter, latex, condoms, gloves, paper towels, panty liners, plastic bags, trash, sanitary napkins, tampons, toys or any clothing.

SOME SUGGESTIONS

You can protect your wastewater system by using traditional non-toxic cleaners, like vinegar and bicarbonate of soda, in the kitchen and bathroom. You may also be able to buy (or make your own) environmentally friendly household cleaning products. However it is realised that these are not often available or are too expensive. The key is to use potentially toxic cleaners sparingly. Septic tanks will recover from small doses of toxic compounds. For more information on ecological household products try the following 2 websites: www.ecostore.co.nz and www.ecobob.co.nz.

CHECK THE WASTEWATER TREATMENT UNIT, LOADING UNIT AND LAND APPLICATION FIELD

The treatment unit must be the correct volume for the size of the dwelling it serves and the daily volume and type of wastewater it receives. Get advice on this from a qualified person.

The treatment unit construction must be sound and must be sealed and water tight.

Trickle loading to the land application field is not normally recommended. Instead, dose loading using a pump, siphon or flout is normally recommended and qualified advice should be sought to ensure correct sizing and reliable operation.

Divert all stormwater well away from the treatment unit and the land application field.

The land application system must be sized to not only match the volume and quality of wastewater being received but also the soils and site conditions it is being applied to. Qualified advice on the location, sizing and design of your land application system should be sought. The design of the land application component is as critical as installing a reliable and resilient treatment unit.

Check the land application field for surface ponding, wet muddy patches and leakage of overflows to streams. If there is a problem seek advice from an experienced and qualified person.

<p>NOTE: In terms of the ecological risks, maintaining a fully operational and problem-free land application field is the most important measure to take.</p>
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REGULAR SERVICING OF YOUR WASTEWATER SYSTEM

If you do not regularly service your car it will breakdown and cost you a lot more money to keep on the road. Similarly it is good economic practice to have your wastewater system regularly serviced by a competent servicing agent.

On-site wastewater management systems need regular maintenance to continue to work properly. The impact on local ecological systems and the risk to public health will be minimised if the system is well-maintained.

Ensure that a qualified servicing person;

- Checks the treatment unit on a regular basis. (Seek advice from the system designer on a suitable servicing programme. It will depend on the type of system installed);
- Cleans filters and checks all mechanical components (pumps, aerators, alarm sensors.....);
- Checks the sludge levels;
- Follows the maintenance and servicing requirements specified by the suppliers of the components.

If your treatment unit is a septic tank have, your septic tank pumped out every three to five years (depending on the size of the tank and how much material is going into it)

OR

For a more accurate assessment of when you need to pump out your septic tank, consult a registered servicing agent. They will normally advise pump out if the scum layer (layer of crust on top) comes down to within 100mm of the bottom of the tee junction or filter at outlet. Or when the sludge (build up of material on bottom of tank) and scum have accumulated to the extent that the scum and sludge take up 2/3 of volume of the tank's first chamber (check yearly).

Maintain a written record of problems, servicing and maintenance of the wastewater system

Consider purchasing a servicing contract with a qualified and experienced servicing agent.

KEEP GOOD RECORDS

Keep secure records about your wastewater system. For example:

- A plan showing the location of treatment tanks, drains, pipework and land application field;
- Permit and compliance documents;
- Servicing activities, dates and costs.

These documents should be passed on to future occupants of the property.

CHANGE OF OWNERSHIP?

The design report and specifications, site plan, consent notice, producer statements, installation certificates, servicing agreements and manuals for the wastewater system, should be kept in a handy and safe place. These are to be given to a new owner, if and when, a property changes ownership.

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