

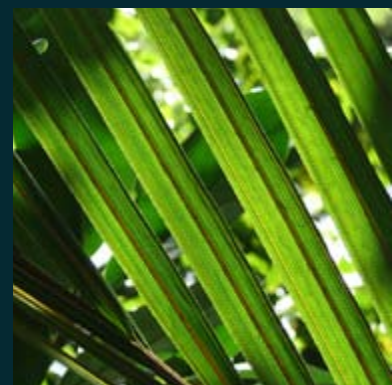


naturalflow

eco-wastewater & sewage systems

by Waterflow NZ Ltd

'We do it simpler'



**New Zealand's Leaders in Eco-Sustainable, Odourless
Wastewater and Sewage Systems**

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• Testimonials

Adam & Karen

We have lived with a NaturalFlow waste water system now for 4 years.

We choose NaturalFlow because we wanted an environmentally friendly system that didn't require expensive, on-going maintenance. Our system has delivered exactly what we wanted.

We have a system which requires no electricity, no pumps, makes no noise and best of all only requires us to lift the lid and check the worms when we feel like it.

About 2 years ago, we discovered that our original Worminator had moved because of hydrostatic pressure caused by unusual ground movement and wasn't working as well as it should (this was no fault of the product). We contacted NaturalFlow and they supplied a replacement upgraded tank at no cost with no questions asked. The measure of a company is how well it stands behind its product when something goes wrong and NaturalFlow certainly stood behind their product!

We have been using this tank now for 2 years and have not had a single problem.

I can't recommend NaturalFlow enough. If you want a simple, low cost, environmentally friendly sewage treatment system you really can't go wrong with NaturalFlow!

M.Vincent

"Back in 2008 along with our building projects we decided to go for the NaturalFlow sewage system as it didn't require any power, on our site. We have been very impressed with the performance of this system, with very little maintenance, it basically looks after itself.

Without hesitation I would recommend the NaturalFlow system to anyone as I have had no difficulties with product or the friendly team at Waterflow NZ Ltd.

R.S.Allan

In 2007 we were in the planning stage for our new house at Hahei. This also included looking into waste water systems. A friend of ours who had not long finished a new house in Pirongia had installed NaturalFlow System and he was very impressed with it. However they were in the country and on sloping land. Our site is in the residential area of Hahei and being flat, and on the flood plain area we knew we had to get the right type of unit.

After intensive investigation we choose the NaturalFlow System.

The reasons were:

1. The unit could be installed mainly above ground, this being needed because of flooding. We beautified the area by building raised garden around it on three sides the fourth side is the deck from the house. Hence we needed a unit that wasn't going to give us any odour.
2. The run off due to the height of the unit then could go out at ground level with a raised grassed mound over it.
3. It was the lowest power required system we could find and only needing power to pump a tank of black water out to the evaporation field very occasionally and this was only needed due to our very flat area.
4. Also only having the black water go through the worm tank made a lot of sense to me.

The unit has worked without a hitch since the day we started using it now over two years ago.

Any queries we have had have been answered by NaturalFlow Systems very quick and efficiently.

I would highly recommend this system.

Feel free to visit www.naturalflow.co.nz for more of our customer testimonials.



• *Introducing NaturalFlow*

The 'NaturalFlow System' works just how it sounds!

Keeping it simple is our philosophy, using **power free natural aerating** processes, instead of mechanical pumps etc, to treat wastewater to advanced secondary levels.

Nature is one huge recycling mechanism, and the '**NaturalFlow System**' works with 'Nature' by harnessing these processes and forces, that have been quietly working together for thousands of years to break down and decompose waste all around us, in an enclosed eco-system that simulates the forest floor, to treat and break down your wastewater until it is perfectly safe to be re-introduced into the environment, via the soil, and of course – 'Nature' does all this, for you, for FREE!

'We do it Simpler'

From the beginning Waterflow's engineer's vision in developing the '**NaturalFlow System**' was to reduce the high-tech dependency with the consequent risk of system failure, costly power usage and meticulous monitoring that is all too common with most onsite sewage systems.

To achieve this, the engineer has combined various forms of well researched and established passive treatments and natural processes, which are very proficient at treating sewage and wastewater and are so effective that they actually reduce the solid waste by up to 95%.

Cost Effective

With simple, straightforward installation and operation, the '**NaturalFlow System**' requires no power in the treatment processes, so it's cost effective from day one, and into the future.

The system accommodates and works with all of today's conveniences such as conventional toilets, waste-master units from the kitchen and even existing wastewater management systems that need upgrading.

In this way, costs involved with installing and maintaining the NaturalFlow system are kept to an absolute minimum.

Minimal Maintenance

It's commonly known by industry and home owners alike, that it's the solids, grease and grit of wastewater that is the major cause of system failures. NaturalFlow solves this problem from the very start, by separating the black water, for special attention through the Worminator® module which reduces the solids by up to 95%, using vermiculture.

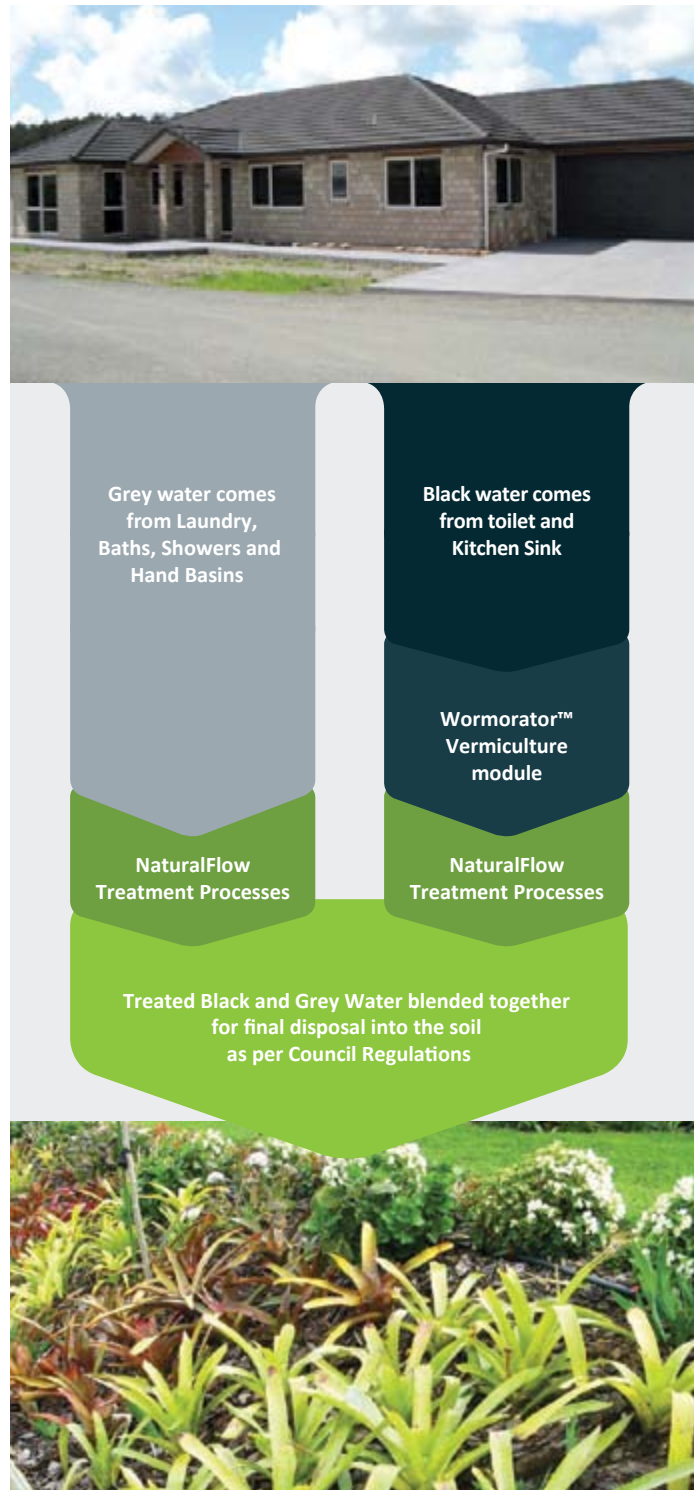
By removing and reducing these pollutants at the very start of the process, the downstream treatment of the liquid content is 'plain sailing'. This dramatically reduces on-going system maintenance to virtually zero, and ensures the system will continue to operate at peak performance for years.

Environmentally Friendly

NaturalFlow is a natural system that uses well-established, sustainable natural processes to treat domestic and commercial wastewater. The system does not draw on any other resources and does not use external power in any of the treatment processes. NaturalFlow supports self-sufficiency, is easy on the ear and on the eye, and is a quiet passive system with no noisy mechanics or high-tech electronics. The resulting effluent is odourless, and with the system housed beneath the ground - the NaturalFlow will soon be completely hidden by plant life.



• *Introducing NaturalFlow*



• *How it Works*

The NaturalFlow system has been developed with the 'Homeowner' and their surroundings in mind. A system that would deliver consistent high levels of treatment with minimal operational demands, was robust enough to take modern appliances like waste masters, and was cost effective from day one and on into the future.

Robust and Powerful

Moving up the chain of life-forms capable of digesting solid matter from human and food wastes, Waterflow NZ Ltd came to the conclusion early that vermiculture and biological processes offered the best means of treatment, for the solid waste, without using mechanical or electronic means.

As has been shown through extensive trialling, these vermiculture processes, which reduce the solids by up to 95% are unmatched by any other type of system, meaning virtually no ongoing 'pumpouts' or hassle of getting rid of this sludge. Also waste from a kitchen waste master is easily handled by the System.

Worms are not only capable of digesting human waste (including toilet paper and kitchen scraps) but are also far less sensitive than micro-organisms to their diet and to ambient environmental conditions.

There are no mechanically moving parts in these processes and nature's power is FREE.

Simply put... 'We do it Simpler, Nature's Way!'

Treatment Processes

With the NaturalFlow System the black water (toilets and kitchen) is separated from the grey water (showers, baths, basins, laundry etc...) at its source, so there is no emulsifying of the solid waste with the bulk of the wastewater.

By separating the black water, which is typically 1/3 in volume and has about 98% of the solids, from the grey water, which is the bulk of the wastewater, typically 2/3 in volume with very little solids, the following treatment of the wastewater is greatly simplified, as the bulk of the solids are now already separated from the liquid.

Black Water Treatment

Treatment of the black water commences in a purpose designed unit known as the WORMORATOR®, which is an enclosed Eco-System simulating the forest floor, where the solids are separated from the liquid and treated through vermiculture and other natural processes and filter media's, which do not require any power source.

In the NaturalFlow WORMORATOR® chamber, the Black Water is directed onto a bed of bark medium which is designed to filter out the liquid and retain maximum solids. These residual solids are seeded with Tiger Worms which then break them down and convert them into valuable water soluble nutrients.

The liquid wastewater and nutrients then trickle flow through various levels of natural filtration medias, which further purify and treat them, to high levels of clarity, until it is ready to be introduced into the soil via a Land Application System (Disposal Field), according to AS/NZS 1547 Standards and other relevant Local Authorities requirements.



• *How it Works*

Grey Water Treatment

Treatment of the large volume grey water, as separated from the black water, is greatly simplified, and is accomplished through a series of natural settling and filtering processes that successively reduce scum and solids to a point where they are insignificant. Given that grey water has low solids but will carry soap scum that, if retained for too long, will begin to putrefy (become oxygen depleted and allow anaerobic bacteria to proliferate), retention time is important. It has become more and more apparent through field testing and trials, by many authorities, that the sooner this water is returned to the environment the less hazardous it is.

Final Disposal

After treatment the black water is recombined with the grey water for final disposal into the soil.

The treated effluent is dose loaded from the NaturalFlow system, via a gravity or pump discharge system, into whatever Land Application System best suits your site or needs whether it be driplines, ETS beds, mounds, conventional trenches etc... designed according to AS/NZS 1547 and the relevant Local Authorities' requirements.

The size and extent of the disposal system is determined by the receiving environment and the expected flow volumes. Factors such as soil types, slope and the proximity of potentially sensitive environments such as creeks and waterways, determine the extent, location and type of disposal system chosen.

Nature does look after herself!

However... it can't be neglected!

Although NaturalFlow is a natural living system, as with all living organisms a little care will ensure that it will run at peak performance for many years.

All Homeowners are provided strong Owner Education on the operation of their NaturalFlow System and greatly encouraged to maintain periodic checks of their system.



This mainly involves simple visual checks;

- Wormerator operation
- Disposal field operation
- Any pump alarms (if applicable) are working
- Dose siphon operation (if applicable)
- Condition of plants in Plant Filter (if applicable)



• 12 Reasons Why

1. Power Free Treatment

Save - No power required in treatment processes.

90% less power than standard systems on a flat site and No Power needed on a sloping site

2. Minimal Maintenance

Save - 75% less maintenance than most other systems.

Uses truly natural processes that work and run forever without constant monitoring

3. Cost Effective

Save - Nature's active Bio-System - sustainable natural processes that work for you, for FREE! Producing a high quality, odourless result

4. Quiet Bio-System

Enjoy - uses completely natural processes that mimic the forest floor. No noisy aerators and pumps running constantly (as associated with other systems)



5. Environmental Care

Relax - Uses well established and sustainable natural filtration processes to take care of your wastewater, just like 'nature' does. Converting solid waste into valuable liquid fertiliser that will greatly enhance your landscape

6. Versatile

Choice - A modular system built to suit your individual needs. From primary through to secondary treatment, your system is designed for your specific site and your particular needs



• 12 Reasons Why

7. Robust and Rugged

Great – With high resistance to ‘shock’ and ‘intermittent’ loading

8. Says ‘YES to Waste Masters’

Excite - ‘YES’, at last a system so robust you can have a ‘waste master’ in your kitchen sink, which is not recommended by any other system

9. Standard Toilet Systems

Save - Accommodates and works with all of today’s conveniences including conventional toilets and fittings



10. Great for Difficult Sites

Simple - With only light machinery required, the modular design of the NaturalFlow system, makes it a perfect fit for steep, low soakage and difficult to get to sites as most modules can be Man-handled into place

11. Save Your Water

Free - A precious element in today’s world that needs protecting for the future, so being able to recycle your grey water is a great advantage for you to enjoy. (Ask for more detail re this possibility on your site)

12. Performance Guarantee

Peace of mind - You can have the absolute assurance of hassle free sewage treatment, for your site.

• Warranty

WATERFLOW NZ LTD warrants that the NaturalFlow System will be free from defects in material and workmanship for the following periods of time from the date of installation as set out in the following conditions:

1. Roto-Moulded tanks 15yrs
2. Filter media 15 yrs.
3. Dosing float and/or pumps 2yrs
4. WATERFLOW NZ LTD will at its discretion replace or repair such components that prove to be faulty with the same or equivalent part at no charge.
5. Warranty of Operation covers the performance of the NaturalFlow System as connected to the effluent inflow for which they are designed, and has been installed to the criteria as set out in the relative installation instructions and procedures, and has an assigned Service/Maintenance contract in place with Waterflow NZ Ltd or it's appointed agent/s.

Warranty excludes defects due to:

- A) Failure to use the system in accordance with owner's manual.
- B) A force majeure event outside the reasonable control of WATERFLOW NZ LTD such as (but not limited to) earthquake, fire, flood, soil subsidence, ground water table variations or plumbing fault.
- C) Modifications to surrounding landscape contour after installation
- D) The actions of a third party
- E) The system required to bear loads (either hydraulic or biological) greater than that for which it was designed
- F) Any modifications or repairs undertaken without the consent of WATERFLOW NZ LTD
- G) Failure, where applicable, to fence and plant disposal field.



Dean Hoyle
Managing Director.



• Homestar Verified



GreenBuild:

Independently reviewed according to Greenstar and Homestar efficiency objectives, and will contribute points towards your GreenBuild project.



• System Combinations

Advanced Primary Plus Series 1500 Treatment System

- 2 module combination
- Capable of treating a total daily flow volume of 800 litres to 'Partial Secondary' treatment level
- Commonly used for 1 – 2 bedroom houses and also smaller sleepouts, baches, recreational and transportable dwellings, farm accommodation and other temporary dwellings or rural commercial sites with up to 16 day staff
- Land Application Systems – LPED surface or subsurface, ETS bed, soakage bed, conventional trenches, mounds, sand trenches and arches (not suitable for PCDI dripline)
- Average fully installed price \$9,500.00 +GST (subject to site constraints and topography, regional regulations etc...)
- System complies with NZ Building Code, NZ Standards and Regional soil and water rules.
- 15 Year Warranty



Advanced Primary Series 8000 Treatment System

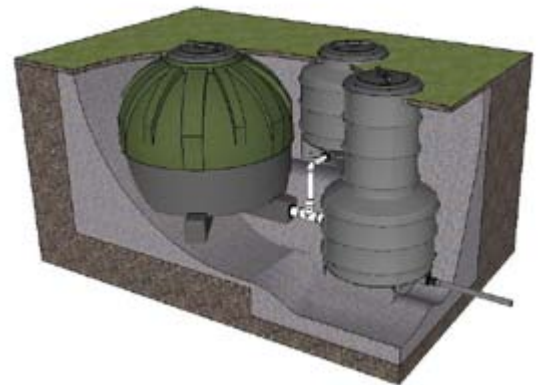
- 2 module combination
- Capable of treating a total daily flow volume of 2000 litres to 'Partial Secondary' treatment level
- Commonly used for 3 – 6 bedroom houses, sleepouts, baches, recreational and transportable dwellings, farm accommodation or rural commercial facilities with up to 40 day staff, schools, marae, camp grounds, holiday homes, motels, golf clubs, café's, stables or other animal facilities...
- Land Application Systems – LPED surface or subsurface, ETS bed, soakage bed, conventional trenches, mounds, sand trenches and arches (not suitable for PCDI dripline)
- Average fully installed price for 4 bedroom dwelling \$11,500.00 +GST (subject to site constraints and topography, regional regulations etc...)
- System complies with NZ Building Code, NZ Standards and Regional soil and water rules.
- 15 Year Warranty



• *System Combinations*

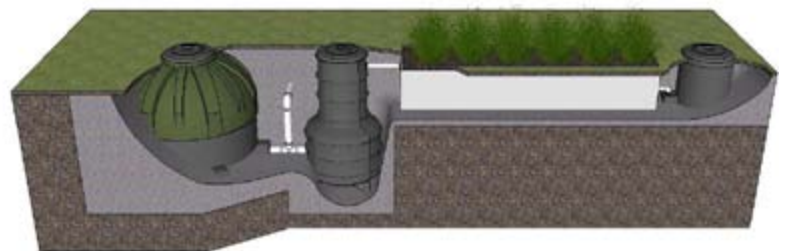
Secondary Series 11000 Treatment System

- 3 module combination
- Capable of treating a total daily flow volume of 2000 litres to 'Secondary' treatment level
- Commonly used for 3 – 6 bedroom houses, sleepouts, baches, recreational and transportable dwellings, farm accommodation or rural commercial facilities with up to 40 day staff, schools, marae, camp grounds, holiday homes, motels, golf clubs, café's, stables or other animal facilities...
- Land Application Systems – LPED or PCDI - surface or subsurface laid, ETS bed, soakage bed, conventional trenches, mounds, sand trenches and arches
- Average fully installed price for 4 bedroom dwelling \$14,000.00 +GST (subject to site constraints and topography, regional regulations etc...)
- System complies with NZ Building Code, NZ Standards and Regional soil and water rules.
- 15 Year Warranty



Advanced Secondary Series 12000 Treatment System

- Water Polishing Bioreactor (plus dose chamber for gravity systems) – sized according to design flows. (Can be positioned after the Series 1500 or 8000 Treatment Systems)
- Capable of treating to 'Advanced Secondary' treatment levels
- Commonly used for 3 – 6 bedroom houses, sleepouts, baches, recreational and transportable dwellings, farm accommodation or rural commercial facilities with up to 40 day staff, schools, marae, camp grounds, holiday homes, motels, golf clubs, café's, stables or other animal facilities...
- Land Application Systems – LPED or PCDI - surface or subsurface laid, ETS bed, soakage bed, conventional trenches, mounds, sand trenches and arches
- Average fully installed price for 4 bedroom dwelling \$18,000.00 +GST (subject to site constraints and topography, regional regulations etc...)
- System complies with NZ Building Code, NZ Standards and Regional soil and water rules.
- 15 Year Warranty



(Positioned here after a Series 8000 Treatment System)

• *Frequently Asked Questions*

1. How does your System work?

Waterflow NZ Ltd, after following the history of sewage treatment, recognized the benefits of treating the low volume, high toxicity black water (from toilets and kitchen sink) separately from the high volume, low toxicity grey water (from baths, showers, dishwashers, laundry etc).

Separated at their source, these waters receive selective treatment in view of appropriate disposal into the environment. The black water passes into the WORMORATOR® which is an enclosed Eco-System, simulating the forest floor, where the solids are separated from the liquid and treated through Vermiculture and various natural processes and filter media's. Vermiculture processes, as shown through extensive trialling, reduce the solids by up to 95% which is unmatched by any other type of system meaning virtually no 'pumpouts' or hassle of getting rid of this waste. Treatment of the large volume grey water is through a series of natural filtration processes. This water is then combined with black water for final disposal into the soil as per council regulations. The NaturalFlow system also welcomes the use of a Waste Master in the kitchen sink, an added bonus if you so desire!!

2. Availability?

Systems are normally held in stock and ready for dispatch from the Waterflow yard.

3. Does it require Power?

No, the NaturalFlow system uses completely natural aeration processes and does not require an external power source in any of the treatment process - in fact where you have a sloping section you do not require any power whatsoever!

4. Can the Grey Water be reused?

Yes, this water can then be used for surface or sub-surface irrigation eg; watering trees, hedges, plantings, orchards etc.

5. Does it require a Soakage Field?

Yes, you will need either driplines, or a soakage field or a combination of both depending on which model or series you choose. These options also depend on the council requirements for the area and the soil types etc on the site.

6. Is it accepted by Councils?

Yes, Waterflow NZ Ltd has worked with virtually all district and regional councils nationally to gain consent status acceptance. Waterflow will work through all the needed requirements and consents that your council requires.

7. What's needed for Council Consent?

In most cases an Onsite Disposal System will be a permitted activity and all the Council will require is a site assessment, which can be done by your NaturalFlow installer.

8. What are the Maintenance Requirements?

Maintenance is set out in a homeowner's manual. The home owner can be trained to manage their system as it is very straightforward and mainly involves only simple visual checks on the system. Waterflow would recommend a yearly visit from an installer and some councils are now starting to insist on this.



• *Frequently Asked Questions*

9. How do I protect the Worm Colony?

You can help maintain an effective wastewater system on your site, by ensuring no toxic or high chlorine chemicals are put down the kitchen sink or toilets. A good practice guide will be provided with your new NaturalFlow System.

10. Do Antibiotics or sickness have any effect on the worm colony?

Antibiotics when used in the home through periods of sickness have proven to have no adverse effects on the Worm Colony.

11. Does temperature affect the Worm Colony?

The Tiger Worms are bred in Cromwell, Central Otago, where they have extreme temperatures ranging between -7° to 38°C. They are well adapted for all of New Zealand's harshest conditions.

12. What if the Worms die?

This would be very unusual and would have to be a result of prolonged flooding or toxic chemicals, but this will show up very quickly, through visual checks, and the Worminator can easily be reseeded with Tiger Worms.

13. Can I install it myself?

The NaturalFlow system, as with all sewage systems, must be installed by a Registered Drainlayer or preferably by an accredited NaturalFlow installer.

14. Can I use my own Drain Layer?

Yes, but the advantage of using an accredited installer is they will provide technical support before, during and after installation.

15. What is the difference between Advanced Primary and Secondary Level Treatment?

It relates to the treatment level or purification of the wastewater, with Secondary being more pure than the Advanced Primary level.

16. What is the distance allowed for a System from a building?

Anything greater than 3 meters from the building, under permitted activity.

17. What shouldn't you flush down your toilet?

Dental floss, feminine hygiene products, diapers, cotton swabs, cigarette butts, cat litter, and other kitchen and bathroom items that can clog and potentially damage septic system components if they become trapped.

Flushing household chemicals, gasoline, oil, pesticides, antifreeze, and paint can also stress or destroy the biological treatment taking place in the system or might contaminate surface or ground waters.



***Well established NaturalFlow System
An odourless and quiet operation***



• Compare Us

Compare us to Septic Tanks, Aerated Systems, Sandfilters and Compost Toilets

There are a fairly large number of different technologies, methods, brands and systems that will all treat sewage and wastewater to some degree or level.

Laying the basis for most of these is one of the oldest and most basic approaches, for handling sewage and wastewater – ‘The Septic Tank!’

This really being the fundamental weakness of most treatment systems.

In order to help you understand how, in principle this operates, we have done below some simple comparisons to the most commonly used systems today.

Comparison of Different Sewage Systems

Septic Tanks - sewage disposal system



Septic tanks are a rudimentary method of separating water from the waste material using the simple principles of settling and retention, and anaerobic treatment.

All your sewage and wastewater is piped into one big tank and then, given time, the solids will settle to the bottom and the lighter scum will float to the top, leaving in the middle liquid that is hopefully relatively clear of solids.

This water, from the middle layer, is then pumped or dosed out to your soakage fields.



The NaturalFlow approach separates the black and grey waters at their source for selective treatment within the system. The solids, using natural filtering, are separated from the liquid right at the beginning or entry into the system, in the Worminator® module, and reduced down to harmless humus by a whole eco-system of worms and organisms that have been doing this work for thousands of years without a pause, and of course nature does this all for you for free!

The liquid which is then extremely free of contaminants is very easily further filtered and treated through successive natural processes before being returned to the environment carefully.

The NaturalFlow system works totally on aerobic treatment processes.



As the solids and scum layers increase and build up the ‘middle water’ becomes narrower and more and more solids are then pushed through the tank out to your soakage fields and then all the problems start – smelly, smelly, smelly!!!!!!

Or, if you have a sudden influx into the tank (called shock loading), say at Christmas time when the family is around or such, the same thing will happen – no time for the solids to separate and settle so through they go, out into your soakage fields to start causing you trouble!!



• Compare Us



The other reason septic tank systems fail is when the leach field clogs up with the solids in the effluent. When this occurs, the effluent cannot absorb effectively into the soil and will cause pooling or runoff. This can lead to groundwater contamination and overflowing trenches, surcharging hazardous (and odorous) effluent. A health hazard to both humans and animals.



The NaturalFlow approach removes the solids and scum from the sewage right at the beginning of the treatment process. It's commonly known by industry and home owners alike, that it's the solids, grease and grit of wastewater that is the major cause of system failures. NaturalFlow solves this problem from the very start, by separating the black water, for special attention through the Worminator® module which reduces the solids by up to 95%.



To try and combat this, inherent weakness, the tanks have become bigger and bigger and they need to be pumped out, and all the solids and scum removed, on a constant cycle of 3 – 5 years, which of course you must pay for. This waste is then loaded into the local reticulated sewage system causing extra expense and loading there.



By removing and reducing these pollutants at the very start of the process, the downstream treatment of the liquid content is 'plain sailing'. This dramatically reduces ongoing system maintenance to virtually zero, and ensures the system will continue to operate at peak performance for years.

Aerated Treatment Systems



Most have a septic stage, with the same problems as a septic tank.

In contrast to what is found in nature, mechanical aerating wastewater systems are water-based. To drive decomposition in this oxygen-poor environment, they must use energy-intensive aerators to pump oxygen into the wastewater and its many moving parts can be unreliable and expensive to repair. High maintenance costs, running costs, and high potential for odour.



Silently and continuously...nature is breaking down waste all around us.

In nature, most decomposition takes place in land-based, oxygen-rich humus. This highly efficient decomposition of waste is by a complex range of soil organisms. Without this, decomposition would cease and we could no longer live on this planet.

Why use high-energy mechanical aerators up to 24 hours a day to inject oxygen into wastewater - when the energetic worms and other organisms in the Worminator® will continually treat the wastewater using the oxygen from the ambient air?

Letting nature do the aeration on a typical on-site wastewater system eliminates more than 1000kW hours per year.... Wow!



• Compare Us

Sand Filters



Have a septic first stage, with the same problems as a septic tank. The septic tank which must have its sludge pumped out periodically is then followed by a sand filter with a very large footprint; Sandfilters because of the septic tank first stage are also susceptible to overloading and clogging.



NaturalFlow takes care of all those solids right at the beginning of the treatment process, once and for all.

Composting Toilet



Compost toilets are “dry composting systems”. This means they don’t treat greywater, so a separate greywater treatment system is required. They also can be susceptible to flies, gnats and odour. Requires high level of maintenance by the home owner/occupier – no “flush & forget”.



Whereas NaturalFlow is a “wet composting process” and takes care of all your wastewater and sewage.

Conclusion

The NaturalFlow system harnesses the forces of nature and gets them working for you in the way they have been working for thousands of years, and continue to do so today.

Being incredibly robust and tough and able to handle all manner of loading rates is only one of the many benefits the NaturalFlow system delivers along with superior consistent treatment.



**Secondary Series 11000
Treatment System**



• Home Owner Care

DO...

- Check faucets and toilets for leaks; make repairs if necessary
- Use low flush toilets where possible
- Use a 'displacer' to reduce the amount of water needed to flush older toilets
- Use aerators on faucets and flow reducer nozzles on showers to help lower water consumption
- Reduce water levels for small loads of laundry
- Wait until the dishwasher is full to run it
- Densely plant your field to maximise transpiration. Plant only recommended wetland plants over and near your septic system and check regularly for even wastewater distribution and even plant growth
- Perform regular monthly visual checks of your system and field
- Grass should be mowed or trimmed regularly to optimise growth and prevent the grass from becoming rank
- Use planting, low chain, signage and/or fences to discourage access in public areas. If public access ways are near the disposal area, you will need to fence the disposal area off
- Use signs, fences and plantings to prevent any vehicle or stock access
- Keep records of all maintenance undertaken on the wastewater systems
- Monitor and care for your Wastewater System as per instructions in the home owner's manual

DO NOT...

- Use chlorine based disinfectant & cleaning products (Cleaners high in chlorine, phosphorous or ammonia must not be used) in the toilets or kitchen sink
- Over use heavy cleaners that kill beneficial bacteria in the septic system
- Pour any toxic/strong chemicals (paint, oil, grease, paint thinners or pesticides) down any drains
- Flush down your toilet – Dental floss, feminine hygiene products, diapers, cotton swabs, cigarette butts, cat litter, and other kitchen and bathroom items
- Discard any drugs down the sink or toilet
- Empty rubbish bags into the Worminator
- Alter or add any part of your system without Waterflow NZ LTD's approval

Further helpful hints:

Your NaturalFlow system is a living organism and some cleaning products have the ability to kill these organisms. When purchasing products such as cleaners and detergents etc, be sure to check the label to see if the product is either biodegradable or safe to use in sewage systems. Adding bread to the Worminator helps worms to multiply.

Note: You are welcome to install a Garbage Grinder in your kitchen sink. The worms love it!!



• Disposal Field Plantings

Plantings that will soon have your field looking magnificent!

Below are the most common of native and other plant species that are tolerant or fond of moist conditions, such as those associated with wastewater disposal fields.



*Cordyline
australis*



*Apodasmia
similis*



*Alocasia
nigrescens*



Carexx secta

- **Alocasia nigrescens** (Black Taro)
- **Apodasmia similis** (Oioi)
- **Arthropodium Matapouri Bay** (Rengarenga Lily)
- **Carex dispacea**
- **Carex dissita**
- **Carex maorica**
- **Carex secta**
- **Carex tenuiculmis**
- **Carex virgata**
- **Cordyline australis** (Cabbage Tree)
- **Cordyline Midnight Star**
- **Leptospermum Burgundy Queen** (Flowering Ti Tree)
- **Lomandra Tanika**
- **Phomium Surfer**

Note: For a full range of plants and their descriptions please see our website:

www.naturalflow.co.nz



• Images



Tidily placed in the corner of the section



Lush plantings, watered every time you brush your teeth!



Hidden away by plant life



Another hard to care for bank, covered with healthy plantings

• *The History of Wastewater*

The NaturalFlow of wastewater history or the history of sewage from very early days remarkably enough, has a history as long as the history of human development. From the very early days of tribal societies, people became aware of the health hazards posed by disposing of human waste (black water) into the environment immediately surrounding their living area. Archaeological records show that the first attempts at dealing with this situation involved the disposal of waste at special locations with washing and bathing carried out in local streams.



As societies developed, the 'privy' with a night-soil bucket came into use followed by the 'long-drop'. As the density of populations grew, other solutions became necessary and open sewers discharging directly into waterways were common along with night soil carts which disposed of waste onto empty ground at the outskirts of towns.

The wealthy then began to demand better facilities and the flush toilet was invented which, initially, simply drained away to the nearest convenient waterway. People began to realize that the environment was suffering and the unsanitary disposal methods

were leading to the spread of disease, hence a containment system was devised to hold solids and allow some pre-treatment before water was allowed back into the environment and the 'septic tank' was born. It is important to note that at this stage all other waste (grey water) from washing and laundry was still disposed of separately, mostly directly into the environment.

It was not until the 19th century that wide scale reticulation became available (though the Romans had had public sewers) and then only in the towns. With this development, baths and laundries began to be incorporated in homes and consequently black and grey waters were combined for the first time.

In rural environments black and grey water continued to be dealt with separately. Black water was treated in small septic tanks and drainage fields and grey water was applied to the ground, often into gardens and orchards, without treatment. This had the advantage that the high pollutant, low volume black water was contained and treatment required small and relatively inexpensive systems.

The low pollutant, large volume grey water had a relatively low impact on the receiving environment and was often of benefit in the summer months. For example, it was common practice to put soapy water on roses, tomatoes and other plants in order to help control aphids.

As reticulation extended (along with power) in the twentieth century, homes in rural environments added inside bathrooms and laundries and the urban practice of combining black and grey waters was practiced. Consequently septic tanks and their attendant disposal fields increased in size to accommodate the grey water and the benefits of separating black and grey water was lost.



• *The History of Wastewater*

Reticulation demanded better treatment systems and local authorities devised sewerage treatment plants. Towards the latter part of the century, authorities recognised that more sophisticated treatment of these combined waste waters was essential if a sustainable environment was to be maintained.

Of course nature has been the great treatment plant of the past. However, with the high concentrations encountered today, local areas become polluted and environments destroyed, hence the need to treat waste water in more sophisticated treatment plants. Though these plants are very effective where monitoring and adjustments can be made on a daily basis, the smaller counterparts suffer from the downscaling of the systems to single house-lot plants. High unit costs, the need for electricity supply, sensitivity to a wide range of factors (temperature, antibiotics, the nature of input materials etc.) and ongoing maintenance are all factors.

Since reticulated systems are forced into treating the high volume/low pollutant grey water in a mixture with the low volume/high pollutant Black Water, such sophisticated treatment systems are essential. Separation allows a simpler approach to the treatment of domestic and light commercial waste water.

Black Water has a high concentration of solids in suspension and the first requirement is to reduce these to a level where they do not clog the receiving environment. The second requirement is to manage the removed solids in such a way as to render them harmless and to reduce their volume as much as possible. The third requirement is then to treat the carriage water which flows on after the removal of as much solids as possible. This treatment seeks to reduce E-coli, provide for the proliferation of carbonaceous bacteria, which are odour free and assist in the digestion of the remaining fine particle

solids, and to reduce the level of suspended solids to a point where they will not block the delivery system to the receiving environment, and will not cause pollution. Further it is desirable to control a host of other elements which can be hazardous – nitrogen being the principal of these.

It is important to recognise the effect that the history of waste water treatment has had on the NaturalFlow approach today. On a site by site basis it is economic to separate the black and grey water and to treat and dispose of them separately. This allows treatment for the 2 very different types of waste water which is more specifically tailored to the needs of each. NaturalFlow Systems has chosen this approach.





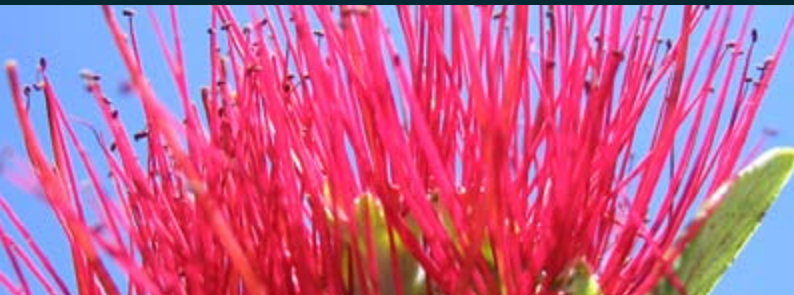
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