



# Wastewater Treatment System Home Owners Manual



# A message from the CEO

## **Congratulations on the selection of the Aqua Nova Wastewater Treatment System.**

The Aqua Nova (AQ) Wastewater Treatment System that you have purchased uses similar processes and technologies to that of the sewage treatment plants used in large townships and cities. The AQ System can efficiently treat all of the wastewater from your laundry, kitchen and bathroom so that it can be safely re-used in garden irrigation.

All Everhard Wastewater Tanks meet the National Standard AS/NZS1546.3. Furthermore, the AQ System has passed a stringent testing program which was undertaken over a period of six months. This means that you can be certain your AQ tanks will be strong and durable and the final effluent irrigated throughout your property will be of the highest quality.

Your role now is to ensure that routine maintenance on your AQ System occurs as outlined within this manual and be aware of the functionality and limitation of the system to ensure its effective operation.

Please read this manual carefully as it includes important information about maintenance and care of your AQ System.

Best wishes,



Simon Higgins  
CEO, Everhard Industries

# The AQ Treatment System

## COMPONENTARY DICTIONARY

Below is a list of each of the components that come with the AQ System and a description of their function.



### POLYMER TANKS

Made from UV stabilised, durable polymer, the two-tank wastewater treatment system consists of a Primary Tank and a Secondary Tank.



### MEDIA FOR BIOFILM

Tube-like structures that sit inside the Secondary Tank, creating a platform for bacteria (or biofilm) to grow and allowing effluent to filter through.



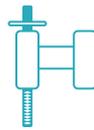
### PUMP

Submersible pump that sits in the Secondary Tank, pumping wastewater to the irrigation system.



### EMERGENCY FLOAT

Positioned in the Secondary Tank, activating the alarm in the event that the pump fails.



### CHLORINATOR

Sits in the Secondary Tank, housing chlorine tablets that disinfect the wastewater.



### CONTROL BOX

Sits on top of the Secondary Tank, housing electrics and aerator.



### AIR VENT

Forms part of the control box, providing ventilation for both the electrics and aerator.



### AERATOR

Sits inside the control box, pushing air down the aerator pipes, providing a constant stream of air to the biofilm via the media.



### ELECTRICS

Electrical panel that sits inside the control box, connecting to the pump, aerator and emergency float.



### ALARM

Sits inside the home, remotely connected to the emergency float, providing an alert in the event that the pump should fail.



### IRRIGATION SPRINKLERS

Installed within the irrigation area on the property, dispersing final treated wastewater to the garden.



### IRRIGATION SIGN

Must be installed around the AQ Irrigation System to warn of effluent wastewater not to be consumed.

# The AQ Treatment System

## HOW THE SYSTEM WORKS

The AQ System is a two-tank, 5-stage process to generate clean, safe wastewater for irrigation into your garden. The system provides a fully integrated and completely automatic treatment process which is designed to treat up to 2000L of household water per day. The system relies on physical, biological and chemical treatment processes to produce high quality water. The efficiency of these processes is heavily impacted by the volume of water entering the system and the quality of that water.

Figure 1 | 5-Stage Process

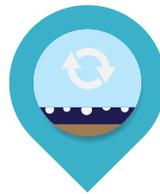
### 1 PRIMARY TREATMENT

All wastewater flows into a Primary Tank that allows for the removal of solids and fats from the raw sewage.



### 3 CLARIFICATION

Aerated water undergoes a final clarification. This allows most of the residual solids to settle, which are pumped back to the primary tank.



### 5 IRRIGATION

When sufficient wastewater has been treated, a pump will activate allowing safe, recycled water to disperse, via the irrigation system, to your garden.



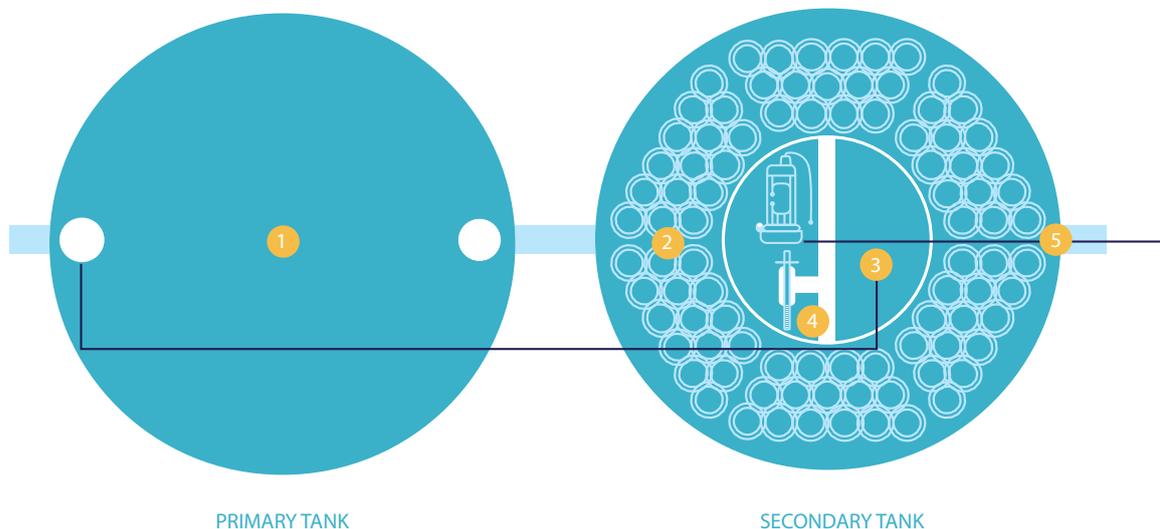
### 2 AEROBIC TREATMENT

Settled wastewater flows into an aerobic zone that is pumped with air using an aerator. This zone is fitted with media, which allows for aerobic bacterial growth that biodegrade residual organic material.



### 4 DISINFECTION

Where specified by local authorities, clarified water is disinfected. This is achieved by allowing the water to flow over chlorine tablets, providing enough chlorine concentration to eliminate any residual bacteria.



# The AQ Treatment System

## PRIMARY TANK

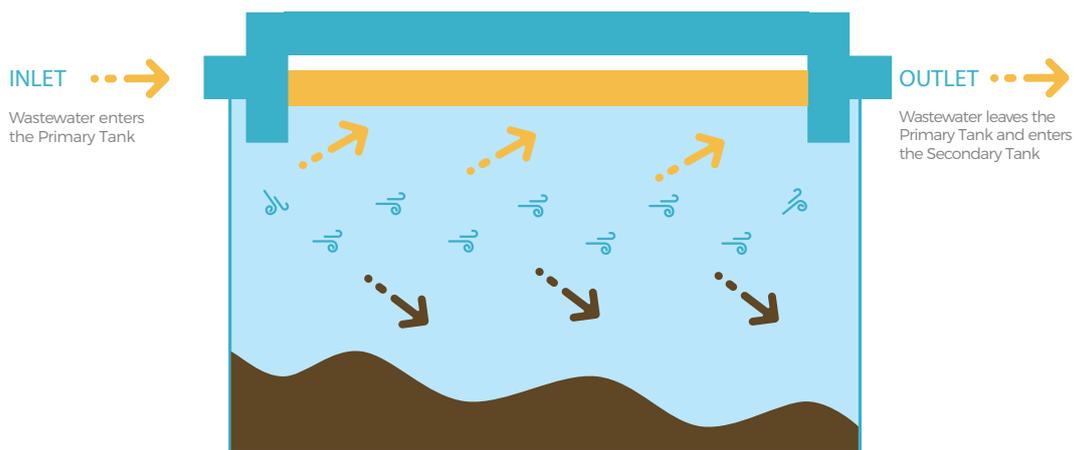


### 1. Primary Treatment

Primary Sedimentation and Anaerobic Digestion takes place in the first tank where we allow for the separation of most of the solids and oils from the water.

The primary tank is designed with a baffled inlet and outlet to ensure short circuiting does not occur to maximise the efficiency of the process. The baffled outlet acts as a dam to limit the release of floated material into the aerobic tank. To improve the efficiency of this process we allow water to remain in the tank for the longest practical time.

Figure 2 | Separation of Contamination



There is no oxygen in the Primary Tank. This, combined with a large amount of settled organic material, allows anaerobic digestion to occur. This is a very slow process and principally occurs at the bottom of the tank.

Complete digestion is achieved through the growth of two types of bacteria. One type of bacteria breaks down the larger organic material to produce organic acids. The other type of bacteria consumes these organic acids to produce methane and carbon dioxide. These two compounds are released as gases. However, as they float to the top of the tank, solids attached to the bubbles are carried to the surface. These solids mix with the separated oils to produce a floating scum or crust.

Problems can occur if a suitable environment in the Primary Tank is not maintained. An influx of massive amounts of water can reduce the quality of effluent leaving the primary tank.

Furthermore, pH levels that drop too low or are too high can impact the function of the tank. An increase in acids such as natural generation of organic acids or disposing of acidic products down the sink, can decrease the pH levels. While use of very caustic washing detergents can cause an increase in pH levels. For optimal performance, pH levels in the Primary Tank need to remain between 6.5 and 7.5.

# The AQ Treatment System

## SECONDARY TANK

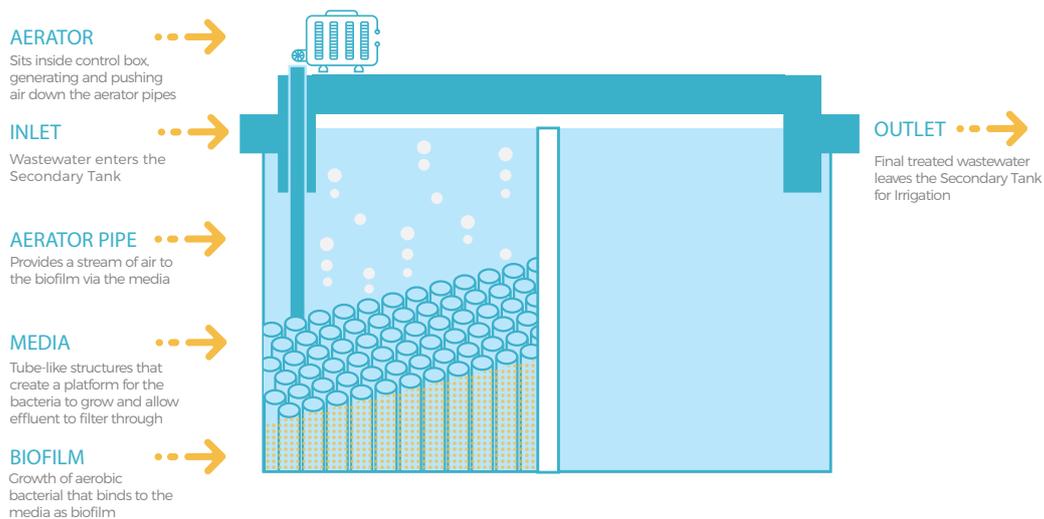


### 2. Aerobic Treatment

The Aerobic Treatment section of the Secondary Tank is fitted with an aerator (pipe) and biological media (tubes). This is where most of the organic material in the wastewater is removed. The aerator provides a constant stream of air to the tank. This ensures that the water in this tank is oxygenated and allows for the growth of aerobic bacteria. While this type of bacteria can live suspended in the water, most of the bacteria will bind to the media to form a biofilm.

As long as the aerator remains operational, the system will run smoothly.

Figure 3 | Biofilm Aerobic Digestion Process



### 3. Clarification

The clarifier is a stilling zone that allows remaining solids to be removed from the treated water, working in a similar manner to the Primary Tank (see Fig 2). Solids settle to the bottom of the tank where they are pumped back to the primary tank to be digested. A small volume of water continuously cycles through the treatment system, allowing for a dilution of incoming wastewater and provides a small amount of oxygen for the oxidation of sulphide compounds.

# The AQ Treatment System

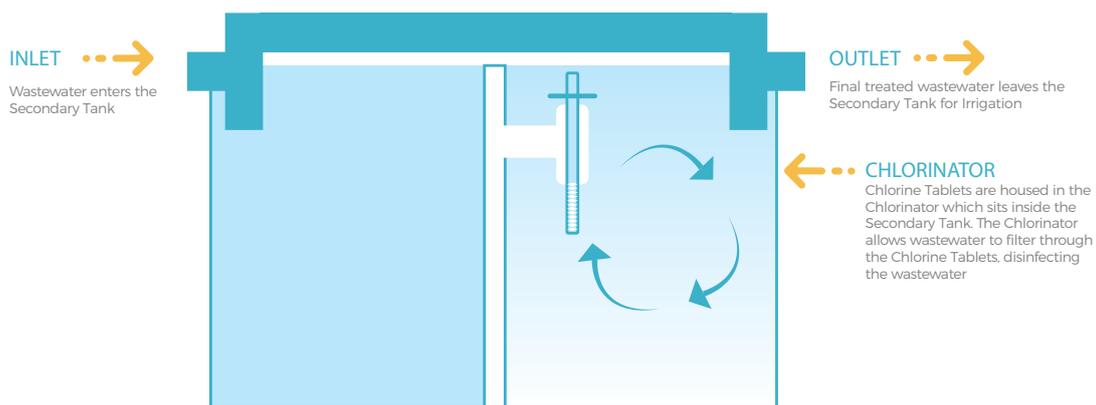


## 4. Disinfection

The system allows for the automatic and ongoing disinfection of the treated water. As water enters this section of the Secondary Tank, it filters through chlorine tablets that sit inside the Chlorinator. For disinfection to work effectively, water must remain in this chamber for the longest possible time so that the chemicals have a greater opportunity to work. This is called 'contact time'.

Disruptions can occur in the system in the event of hydraulic overloading. When vast amounts of water enter the system, it reduces the wastewater 'contact time' and therefore the bactericidal effect of the chemical. Further to this, hydraulic surges can reduce the amount of solids that can be settled in the final clarifier and allow organic material to flow into the disinfection chamber. This material can react with the disinfectant, reducing the amount of disinfectant available for killing harmful bacteria.

Figure 4 | Disinfection



## 5. Irrigation

Treated water is irrigated throughout the property via an irrigation system. This area has been calculated using a standard approved by the local authority.

DO NOT:

- Alter this area without local authority permits
- Change the area so that treated wastewater may enter a dam or watercourse
- Change the area so that treated wastewater may flow onto paths or vehicle traffic areas
- Grow fruit, vegetables, crops or vegetation used for food stuffs in this area
- Use treated water for drinking or for any purpose of bodily contact

The owner is responsible for ensuring that the system continues to satisfy the requirements of the local authority. The owner must ensure that the correct operating conditions are followed.

In some cases, where the local authority permits, the irrigation network may feature moveable sprinklers. These may be relocated from time to time to allow more even distribution of re-claiming water for garden use.

# Owner Responsibilities

When the system is installed, an effluent irrigation system will be installed to safely disperse the treated water. This irrigation system must not be moved, extended or altered in any way without written consent from the local authority.

## pH Levels

A **decrease** in pH can be caused by the natural generation of organic acids. This usually occurs at the startup of a new system and, if it is not corrected, can result in very acidic conditions. This environment can also be produced when acids are disposed of down the sink. Additional acid can result in the production of hydrogen sulphide. This in turn produces an odour.

An **increase** in pH can be caused by the use of corrosive washing detergents. This is due to the volatilization of ammonia.

For optimal performance of the AQ system, the pH level in the primary tank needs to remain between 6.5 – 7.5.

## Hydraulic Surges

The AQ System has been tested under operating conditions specified in Australian Standards that incorporate surges of more than 800L over a five hour timeframe. The treatment processes will be affected if large amounts of water are disposed of at one time. When the primary tank receives an influx of massive amounts of water e.g. from operating too many appliances discharging water, it mixes the settled solids back into the water and results in solids being transferred into the Aerobic Tank. It is best practice to operate only one appliance at a time and slowly release water from a spa or bath.

This can result in:

- Lowering the retention time of the wastewater in all treatment processes
- Resuspension of solids in the primary tank
- Poor settling of solids in the final clarifier
- Poor disinfection

### HANDY HINT

Never attach a stormwater drain to the system

## Organic Overload

The AQ System is designed to treat a specific amount of organic material. An influx of organic material into the primary tank will generate higher concentrations of odorous gases and increase the build up of solids in the tank. This will result in an increase in operational costs as the system will require more frequent pump-outs. If the system is overloaded with organic material there will not be sufficient bacteria or oxygen to allow the waste to be digested. This will result in reduced efficiency of the disinfection process.

## Chemicals

Many solvents, chemicals and other liquid products that are used in households can kill bacteria. Remember that our system uses bacteria to biodegrade organic material, all chemicals that are non-biodegradable waste can pass through the system unaltered and be irrigated on your property.

Approximately 90% of the AQ System requires the growth of bacteria. Disposing of poisons, chemicals and cleaners can kill the bacteria that the system needs to operate effectively and can result in water of poor quality being produced.

Owners are encouraged to limit the amount of disinfectants and bactericides that they use in cleaning, and to adopt practical measures to minimise their general use. If these chemicals must be used, we suggest diluting the material prior to or during disposal. Some chemicals are extremely toxic to bacteria at low concentrations. In order to rectify this, you may require the complete pump-out of both tanks.

### HANDY HINT

Do not dispose of any medicines, chemicals, solvents or paints down the drain



# Homeowner Checklist

The following are some practical hints to help keep your AQ System working to full capacity.

## Around the home

- Ensure you do not use disinfecting agents, bleaches and dyes in the laundry, kitchen or bathroom that will drain into the system
- Ensure you do not use or pour kerosene into the system
- Ensure you do not use toilet cleaners or Blue Loo. They are anti-bacterial and will affect the system
- Ensure foreign matter e.g. sanitary napkins or nappies don't enter the system, creating blockages or adding to waste
- Ensure you minimise the use of a garbage grinder. The solids will overload the system
- Try using natural biodegradable cleaning products e.g. crème, sodium, phosphorus-free and alkaline cleaners
- Try placing bleaches, antibacterial, or antiseptic solutions in a bucket and dispose of the water in the yard
- Try using liquid soaps to prevent build up on hard surfaces. This makes them easier to keep clean
- Try cleaning heavily stained toilets using a bowl of hot suds and allow to stand before brushing
- Try using washing soda in hot water, emptied into the plug hole at night to eliminate any smells that may occur
- Try using only a small amount of detergent, to prevent excessive foaming
- Try using washing soda as an effective fabric softener
- Try pre-soaking soiled nappies in 45g of Bicarbonate Soda dissolved in warm water and wash in hot soapy water
- Try washing the dog in the yard rather than the laundry tub or bath
- Try cleaning paint brushes outside using a bucket of water and don't dispose of water down the sink

## Managing organic loads

- Ensure scraps and peelings produce are not disposed of down the sink
- Ensure you do not dispose of fats, oils, greases or mineral based greases down the sink
- Try removing food scraps from plates and utensils prior to washing
- Try to minimise the operation of food disposal units

## Managing hydraulic flows and conserving water

- Ensure you use one water appliance (washing machine, dishwasher, etc.) at a time
- Try installing water saving fixtures (shower roses, tap nozzles, etc.)
- Try having shorter showers
- Try to spread laundry washing throughout the week
- Try placing a sponge or your plug angled over the plug hole to slowly release water when emptying a bath or spa

## Around the tank

- Ensure no regular pedestrian traffic over tanks are permitted
- Ensure no vehicle traffic is permitted within 600mm of the tanks unless approved load carrying
- Ensure access and inspection covers and the control box **are always** freely accessible and not buried

## Irrigation

- Ensure you do not re-locate fixed sprinkler or sub-surface irrigation outlets without the approval of local authority
- Ensure irrigation outlets are not placed in pedestrian or vehicular traffic areas
- Ensure irrigation outlets are not located where the treated effluent may enter watercourses or dams
- Ensure you do not allow treated wastewater to come into direct contact with crops or other vegetation used for foodstuffs
- Ensure treated wastewater is not used for drinking or for bodily contact

If you have any queries regarding the use of certain products in your system, please do not hesitate to call your Agent or nearest Aqua Nova Distributor.

# Emergencies

Everhard approved service agents offer a 24-hour emergency call-out service for speedy correction of system failures.

All Home Sewage Treatment Plant (HSTP) installations are equipped with an audible alarm that are fitted within your house. This will switch on if either the aerator supply pump or the integrated pump feeding the irrigation system fails.

The audible alarm will NOT be activated if there is a general power failure, or if the supply to the system is interrupted. Following any general power failure, check that the circuit breaker has reset.

Unnecessary service calls can be minimised by the owner first making some simple checks and observations that may indicate to the Agent what the problem may be. In the event of a system fault or alarm:

- Check the circuit breaker and ensure there is power available to the system. If the breaker has tripped reset it to the on position
- Check inside the Tank Top Control Box to ensure both plugs are in their power outlets, and that the air pump is running
- Ensure that irrigation hoses are not kinked or crushed
- Listen for bubbling sounds in the treatment tank

You will need to contact your service agent in the following circumstances:

- Should either of the pumps stop running, check power to the HSTP installation. If the circuit breaker has not tripped, and the pump is plugged in and switched on but does not run
- Should the circuit breaker continue to trip, The AQ System installation is protected by a dedicated circuit breaker fitted in the residential main switchboard by a licensed electrician when the system is installed. This will be tripped if an electrical fault occurs, and power to the aeration supply pump and irrigation supply pump will be shut off. If this happens, reset the circuit breaker
- If a continuous strong odour of sewerage or chlorine appears around the tanks or the irrigation network
- If wet patches appear and remain evident near fixed irrigation pipes or around tanks, or if the sprinklers appear to be receiving water at reduced pressure and are not kinked or damaged, there may be a pump problem

If you do need to call for a service agent, minimise water usage as much as possible until the fault is corrected.

Call for a plumber if any toilet or other fixtures fail to drain freely. Such problems are usually due to pipe blockages rather than HSTP system failure. The plumber will advise you if there is a problem with the system.

# Certification + Warranties

## Certification

All Everhard wastewater tanks meet the National Standard AS/NZS1546.3 and are tested to support the 5kN (500kg) top load, and likely side loading, required by the National Standard AS/NZS1546.1 for small septic tanks.

## Warranties

Your AQ System is fully guaranteed. For strength and durability only superior products are used.

Your system is fully warranted with 15 years for Tank Cases and two years for Electrical and all other components. During the first twelve months the warranty is for parts and labour. After this period all warranties cover parts only.

Keep this manual and all service reports regarding your AQ System in a safe place. They should be handed to the next homeowner if you decide to move.

**For all service calls, contact your service agent:**

Agent: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

Fax: \_\_\_\_\_

You will need to quote your contract number: \_\_\_\_\_

The EVERHARD WARRANTY starts from the Commissioning date:     /     / \_\_\_\_\_

For all Warranty Claims, contact your Service Agent first to arrange for a claim to be processed.

Alternatively, you can contact us:

- by mail at Everhard Industries Head Office, Attention: AQ Sales Manager, PO Box 543, VIRGINIA BC QLD 4014
- by phone on 131 926
- by email at [info@everhard.com.au](mailto:info@everhard.com.au)
- online via our Contact Form at [everhard.com.au](http://everhard.com.au)

# Maintenance Service Contracts

The service contract is an agreement between the homeowner and the installer or organised company. All states require that the AQ System is serviced every three months. Failure to have the system serviced and maintained may void all warranties.

For most states and councils, new installations must be sold with a service contract. This automatically comes into effect on commissioning your AQ System. The initial service contract may include:

- The initial commissioning, and three services, at three-month intervals, at which time samples of the treated effluent are tested for clarity, and the presence of chlorine
- The purging of settled solids from the Treatment Tank Sediment Chamber into the Primary Tank, the replenishment of the chlorine sticks when required, testing and inspection of the electrical / control system, the aerator and irrigation feed pumps
- Issuing of reports of the work done, and any test results, are supplied to the owner. Copies will be forwarded to the local authority as required

Local authorities may also require samples of treated effluent to be tested at any time at the Owner's expense. These tests are not included in the regular service contract

Service calls, which are the result of household practices generally sit outside of the Service Agreement.

## Service Contracts Renewal

After the first year of operation, it is essential to enter into a three-monthly service contract as required by law. Only personnel trained and competent to service these advanced HSTP installations should be permitted to carry out any work on the treatment system. Owners of Aqua Nova systems are strongly encouraged to select an agent appointed and trained by Everhard Industries Pty Ltd and approved by the local authority.

In many cases, local authorities insist that a maintenance contract exist before approval to operate an HSTP installation is granted. Local authorities also insist that contracts for existing installations are in force. Service agents are required to notify local councils about terminated contracts.

## Important Servicing Information

For the purposes of regular servicing, both concrete and polymer AQ System tanks will be installed so that the access and inspection covers are exposed. The polymer tank's sloping top cover may be lightly covered over with mulch or bark, however, access and inspection covers and the control box must always be freely accessible and never buried.

# Maintenance Service Agreement

Servicing Company \_\_\_\_\_

Name of Owner \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

Mobile: \_\_\_\_\_

On payment of scheduled fees, the Servicing Company (stated above) will service and maintain the Aqua Nova HSTP at the above stated address for the period of one year.

## Frequency and Number of Services

The AQ System HSTP will be serviced every third calendar month over the contracted period for a total of four services.

## Work Performed in Servicing

As part of servicing the following duties will be performed:

1. Perform onsite testing of treated effluent quality, limited to Free Residual Chlorine, pH, Clarity, D.O. and Temperature
2. Replace air filters
3. Evaluate Aerator and Pump Operation
4. Test Aerator Pressure Switch and High Level Float Switch
5. Purge aeration lines and adjust sludge return
6. Perform Sludge Monitoring on Primary Tank, Clarifier and Pump Well
7. Clean / Purge Clarifier and Pump Well
8. Check irrigation lines and irrigation sprinklers (where possible)
9. Replace disinfection agent (when necessary)
10. Clean irrigation disc filters and backwash granular media filters (when necessary)
11. Issued service reports to the owner and local authority as required by law

## Services not Covered by this Agreement:

1. Emergency / Alarm Call Outs
2. Asset Replacement, including pumps and blowers
3. Pump out tanks and transfer of untreated wastewater off-site
4. Any additional work requested by the owner

Customer agrees to pay all reasonable costs associated with services not covered by this agreement.

## Asset Replacement

All Pumps and Blowers supplied in maintaining the system will remain the property of the Servicing Company and may resume possession of the item if full payment is not made.

## Payment Terms

- Annual Fee of \$ \_\_\_\_\_ and is payable in advance OR,
- Monthly Fee of \$ \_\_\_\_\_ and is payable at time of service

Servicing Company Rep (Name)	Servicing Company Rep (Signature)	Date

Owner (Name)	Owner (Signature)	Date



## BRANCHES

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Wetherill Park NSW 2164  
(02) 8711 1111

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Dandenong VIC 3175  
(03) 9771 7344

Perth  
28 Haydock Street  
Forrestdale WA 6112  
(08) 9417 8222

