OWNER'S MANUAL

Incorporating Installation and Service Advice

On-Site Domestic
Wastewater Treatment System

Model: ENVIROTECH A.S.F. & GEN 11
Capacity: 10 E.P. (Equivalent Persons)

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ENVIROTECH ASF (Aerobic Sand Filter)

Domestic System – 10 EP capacity

Attained Chief Executive Approval CEA in Queensland in 1993 and has remained an approved system right up until now. From the introduction of the ASF System, it has attracted favourable comments from its customers and the plumbing inspectors. It has lived up to expectations and is still the discerning person's choice.

The basic elements of the system are:-

- Septic chamber – not less than 3900L
- Filter–dosing pump station
- ASF 7.2m² to 20m², typically
- Final effluent pump station
- Effluent irrigation area
    - Type of irrigation - hose and sprinkler; or
      - sub-surface drip

  See accompanying DRAWINGS of the system.

Identification Tag - attached to electrical control box on the tank
- provides contacts for help

Wastewater

Constituents of Wastewater from household source:

- Shower, basin, bath
- Toilet(s)
- Clothes-washing machine and laundry tubs
- Kitchen sink, dishwasher

Harmful products to the treatment process are:

- Greases and fats
- Bleaches
- Disinfectants
- Hair dressing products
- Bacterioudes
- Acids, alkalis
- Poisons (from garden products)
- Commercial-strength cleaning products
- Toxic chemicals
- Quaternary Ammonium Compounds

Special Warning

The treatment plant should not be used for dumping excess old liquid chemicals products lying around the home and garden shed. The predominant microorganisms in the wastewater process both in the initial septic chamber and in the aeration zones in secondary treatment are bacteria. These organisms are sensitive to toxic chemicals and pH. If these organisms are killed by the addition of foreign chemicals to the system, the treatment efficiency can be dramatically affected. The effluent quality required from the plant will not be met.

In extreme cases the contents of the treatment plant has to be pumped out and the plant operation re-established with fresh waste that is not contaminated. Even when small amount of contaminants are dumped into the plant e.g. 1-10 litres, the plant can take up to several days to re grow healthy microorganisms and return the plant to optimum performance.

List of Components

1. Septic tank with partitions - certified in compliance with AS-1546
   - filter-dosing pump well + submersible pump + pipework + fittings
   - final effluent pump well + submersible pump + pipework+ fittings
   - high level alarm float switches

2. Rising main, incl non-return valve (25mm dia) to distribution pipework in the upper zone of the ASF.

3. Rising main, incl non-return valve to effluent irrigation area.

4. Effluent disinfection unit, typically chlorinator with canister to store 20 tablets.

5. 7.2m² or 20m² ASF – detailed on DRAWING.

6. Plastic Liner – provides a seal to prevent loss or gain of liquid from ASF walls or base – underdrain provided with sealed penetration. Liner of woven polyethylene material (grade equivalent carvacon 5000, a Rheem product) which is buried so that no UV break-down occurs (from observation on old systems).

Guarantee of Compliance

The ENVIROTECH ASF is designed, installed, and serviced to meet the requirements of the Queensland Plumbing and Wastewater Code (QPW Code).

Effluent Quality
Enviroment ASF

- BOD_5 less than 20mg/ L
- TSS less than 30mg/ L
- Thermotolerant Coliforms (TC) less than 100 efu/ 100ml (if stipulated)

GEN 11 Envirotech ASF

- BOD_5 less than 10mg/ L
- TSS less than 10mg/ L
- Thermotolerant Coliforms (TC) less than 10 efu/ 100ml (if stipulated)

Start-Up for System

- Fill primary treatment / septic chamber
- Ensure that the power has been connected and the power switch in the electrical control box is ON.
- Test that the pumps and float switches are all operational.
- Await for wastewater for flow into the system. Some mild odour might be detectable for the first 3 weeks while the bacterial population grows.

Intermittent / Holiday use

The ASF has an extraordinary ability to rapidly start the secondary treatment process. From start-up from new, a complying effluent can be produced in only a matter of a few days (2-3 days).

The holiday use case is the same, if not even more impressive because the ASF from previous use will still be harbouring some live micro-organisms within the ASF.

CRITICAL POINTS OF CARE IN INSTALLATION

Sand filters are delicate and here we wish to highlight aspects of the installation where it is recommended particular care is taken

a) A general safety matter. Observe good safety practices when working around an excavation is preparing the hole for the tank(s).
b) When the tank arrives on the crane truck, often with its own crane on the rear of the truck. The crane operator is "in charge" of the site until the tank (approx 7T for a concrete tank) is firmly placed in the excavated hole.
c) Backfill tank quickly up to the level of the A.S.F. floor with fine dry sandy material that easily compacts (to minimise settlement of backfill letter).
d) Excavate A.S.F. pit and associated trench for the underdrain pipe – in order that the plastic liner for the pit hole is not subject to puncture by "sharp" fractured small rock ensure the floor of the pit is covered with sand. If the walls cannot be made smooth it might be prudent to run a 1-1.2m wide strip of root barrier around the walls.
e) Take every care to ensure the penetration through the liner is waterproof; do it slowly and carefully (then it ALWAYS performs its function). Glue the floor flanges to the pipe. Cut hole in the liner exactly the size of the pipe (110m dia). Run a continuous bead of silicon around the pipe on both sides of the liner. Pull the 2 flanges together by the 5 screws and nuts. Watch the silicone squeezing out from each of the 2 flanges as the screws are tightened (a sign of the job being done well).
f) When the final sand cover is being placed on the A.S.F., roll the excess liner up tightly, placing sand on the inside edge and the outside edge at the same time so it can act as a barrier to overland flow running onto the top of the A.S.F..
g) Set the A.S.F. in the ground so the finished height is at least 100mm above surrounding ground level, with the top of the rolled leer around the A.S.F. perimeter being just covered with sand and maybe some topsoil – no liner material should be exposed to sunlight (to avoid U.V. degradation).
h) In the final tidy up of the site do not forget the diversion drain at the topside of the A.S.F. is upslope approximately 3m from the long side of the constructed A.S.F. This diversion drain should be so constructed that is also protects the soil around the tank(s) and the soil in the area between the tanks and the A.S.F. from washout in heavy rain.
i) When the installation has been completed while the house is still under construction it is a good idea to erect some star-pickets joined by fluorescent tape to keep tradesmen vehicles and delivery trucks off the A.S.F.

Servicing Requirements

The ASF only needs servicing ONCE PER YEAR or each quarter depending on local council. By a licenced and fully trained service person. Please refer to on-going responsibility. When the chlorine tablets canister needs replenishing, it is done by the owner. Should normally only be required to ensure pumps (x2) and float switches (x2) are functioning well, and the liquid levels in the canisters are normal.

Primary Treatment / Septic Chamber should only require a sludge pump-out every 3-5 years. Sludge and scum levels shouldbe recorded at annual service.

The 2 pump wells should be cleaned and the washings transferred to the head of the primary treatment chamber.

Effluent Sampling

Typically from a tap on the effluent irrigation pressure main.

Troubleshooting

1. Red Alarm Light ON
- activated by higher-than-normal water level in (i) the flow balancing/filter pump chamber or (ii) the final effluent pump chamber.

Cause: Alarm switch caught on wall
Remedy: reposition cable
Cause: Pressure line blocked (i)
(a) distribution pipe crushed by vehicle damage
Remedy: unblock/repair broken line
Cause: irrigation line block or crushed (ii)
Remedy: locate and repair
Cause: pump reached the end of its operating life (i) or (ii) – usually more than 4 years
Remedy: Replace with new pump (always check normal operation after complete replacement)

2. Top of A.S.F. has localised wet-spot

Cause: pipe damaged by vehicle (car, rider mower, tractor)
Remedy: Dig-up and repair pipe

3. Sewage Odour – treatment plant is vented back through house vent

Cause: the users are mistreating the primary treatment process by adding excess greases and fats to the system (for example) or toxic compounds that inhibit the treatment process.
Remedy: cease the practice. Help return the treatment plant to normal operation by adding Axtizyme (available from supermarkets) for 2-3 weeks.

4. Wetness around the tank

Cause: a faulty sewer connection procedure
Remedy: redo the sewer connection procedure
Cause: a leak (underground) from the effluent irrigation line leaving the tank or the pressure pipe to the A.S.F.
Remedy: drainer to repair
Cause: incorrectly executed connection of underdrain pipe (100mm dia)
Remedy: drainer to reconnect pipe using recognised good plumbing practices

5. Effluent Odour

Cause: misuse of system by owners
Remedy: educate owners of good practices and wait for system to naturally correct itself

ANNUAL SERVICE SHEET – recommended service interval 12 months.

1. Age of SYSTEM _ _ _ _ _ years

No. of persons in home _ _ _ _ persons

2. Primary Treatment Chamber

Odour: ☐ Not Detectable ☐ Mild ☐ Foul

Scum: ☐ Thick ☐ Thin

Surface coverage: ☐ 0 ☐ 25% ☐ 50% ☐ 75% ☐ 100%

Sludge: Thickness Accumulation*: _ _ _ _ _ _ mm

Degree of Consolidation: ☐ Light ☐ Heavy

* If > 600mm – advise client to arrange a desludge.

3. Flow Balancing / Filter Pump Chamber

Sludge build up on floor: ☐ significant – pumped to primary chamber

☐ Not appreciable – no action

Pump function - Normal	☐
Float switch - high-level alarm operating	☐
Pipework in chamber - sound	☐

4. A.S.F.

No ponding on surface ☐ Grass Cover: ☐ good ☐ poor

Underdrain flow with A.S.F. being loaded ☐ poor ☐ slow*
* slow drain-back might be indicating a problem that warrants investigation

5. Final Effluent Pump Well

Effluent Pump function normal - incl high-level alarm light ☐

Floor of chamber – no sludge ☐

6. Effluent Disinfection – when required

Chlorine Tablet Disinfection – the most common
- operating normally and tablet holder refilled with tablets ☐

U.V. Disinfection – rarely used (too expensive)
- U.V. tubes operating ☐
- tubes replaced if been in service for greater than 12 months ☐

7. Effluent Irrigation Area

Visually good condition i.e. owner has maintained it well ☐

No ponding of water or excess wetness of the area ☐

No indication of sprinklers and emitters ☐

Note: If there is an obvious problem in the irrigation system, owner must be informed and action taken for the repairs to be done promptly.

Description of any repairs to irrigation system:

_____

_____

_____

Council has been notified of any repairs ☐

SPECIFICATION SHEET

Pumps 1. Filter Dosing Pump – automatic (in-built ON-OFF float switch
Type – centrifugal – vortex
Model: D15
Make: Davey
Supplier: Davey Pump
Performance: max head 5m
max flow 130L/min
Power requirement: single phase 240V, 330 Watt

2. Effluent Pump – automatic
As for 1 and 2 except large pump
Performance: max head 9m
max flow 330L/min
Power requirement: single phase 240V, 750 Watt

Float Switches

1. High-level Alarm Filter Dosing Pump Well
Type – plastic floating ball with internal micro-switch
Function – 3-wire unit
Make – Q.E.
Country of manufacture: Italy
Supplier: ATS Pumps BRISBANE
Current Rating: max 16 amps

2. High-Level Alarm Effluent Pump Well
- as per 1

U.V. Disinfection Unit

Location: top of tank connected into effluent irrigation pipeline
Type of lamp: high output low pressure mercury vapour lamp
Max throughput: 42 Lpm
Power requirement: 48 Watt
Material of Manufacture: stainless steel
Name of Manufacturer: Sterilight
Model no. of unit: UV S12Q-PA
Supplier: IBC water

Liner - for A.S.F. size as require
- required liner size
to allow for walls and roll-up at top to finish
= 11m x 6m
- material – polypropylene
- construction – woven strands with finish coating to both sides
- equivalent to Rheem CANVACON 5000 (used in truck tarpaulins)
- supplier as required.

Geotextile
- manufacturer and supplier: Geofabrics Australia
- factory Melbourne:
- company's Qld office: Sumner Park
- grade of product: A12
- layer at top of A.S.F. to prevent silt entering the media

Pipework
- P.V.C.
  - 100mm dia sewer
  - 25mm dia Class 12
  - fittings to suit
- supplier: REECE PLUMBING

Raw Materials for A.S.F.
- supplier:

Layer across floor of pit to cover the slotted underdrain pipe
- general thickness 150mm
- with extra mounding over the crown of underdrain
- size of material 20mm
- to be supplied clean/washed with no finer material

Body of A.S.F.
- thickness of layer: 600mm
- size of material: all between 5 and 7 mm
- to be supplied clean/washed with no finer material
- product used by BORAL in the manufacture of bitumen aggregate for road pavement construction

Top layer into which the pressure distribution pipework/manifold is embedded
- depth layed before placing pipework manifold 100-150mm
- final covering layer 50mm deep
- size of material 20mm
- to be supplied clean/washed with no finer material

Sand for furnishing – to be applied after
- placing the geotextile layer across the 20mm layer
- grading of sane – "medium sand" not a fine sand (ideally)
- sometimes supplied a "manufactured sand" with a similar size distribution/grading to "medium sand" (naturally formed)

Approximate Quantities* for ordering this will vary depending on the ASF size

	Cubic capacity	Weight (dry)
5-7mm aggregate	14.6m^3	tonne 22
20mm aggregate	8.0m^3	tonne 12
Medium sand	4.0m^3	tonne 6

*extra material for bedding purposes not incl

Owner's On-Going Responsibilities

1. Be of the habit to look at the System everyday, even if it is just to ensure the Alarm Light (on top of the Electrical Control Box) is not on.
2. Every week walk around the system and the irrigation area(s) just to make sure there are to abnormal wet-spots.
3. Look at the house switch board that delivers power to the treatment plant every week to make sure it hasn't been tripped out.
4. When the service time is due (12 month interval between servicing) contact the supplier/licensed service person and arrange for the routine annual service (some local authorities might call for the testing of effluent quality at the time of service).
5. Make sure the service person issues you with a comprehensive service report (proforma of Service Sheet included in this Manual). If the service detects any irregularities or deficiencies with the system, the owner must acknowledge them and authorise without delay any repairs to be carried out; with documentation being forwarded to council (the service person is legally required to do this).
6. Owner is advised to set up a file for the treatment plant and keep accurate and complete records on the plant.

Responsibilities of Service Person

1. Maintain complete and separate records for all clients.
2. Whenever a fault in any part of the system is detected, the service person must immediately explain the implications of the fault to the owner, and if appropriate ensure that the manufacturer/installer are aware of the issue.
3. Service person need to call for more expert opinion if they are unsure of a problem and how to fix it.
4. Conduct themselves in an ethical manner. Always submit itemised quotation to owner and obtain authorisation before commencing repair work (owners must avail themselves when urgent decisions necessary).

Manufacturer's Responsibilities

1. Supply and Owner's Manual with every Unit installed.
2. Keep a record of the name and address of the persons purchasing systems.
3. Act promptly and courteously on warranty matters.

A Call for Help

When the owner notices a problem with their system, it is likely they will be unable to fix it on the spot. However, after a short attempt, the owner should first call his regular service agent. If that attempt is unsuccessful, they should contact the manufacturer on the all-hours number given on the identification plate fixed to the Unit (which in the case of ENVIROTECH is on the Electrical Control Box).

Warranties

- Tanks/liquid retaining structures 15 years
- P.V.C. Pipework 2 years
- Electrical Control Equipment (house is Electrical Control Box attached to tank) 2 years
- Pumps, Float Switches and Alarm Lights 2 years
- A.S.F. Construction 5 years

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