Acuantia.

# OPERATION & MAINTENCE MANUAL

## ECOROCK
## TREATMENT UNIT

**Capacity 450/600/750 GPD**

GCT GULF COAST TESTING LLC

BIOROCK
engineered for tomorrow

Dear Customer,

Congratulations on your purchase of this BIOROCK Domestic Sewage Treatment Plant. Your new ECOROCK TREATMENT UNIT will guarantee years of trouble-free operation, peace of mind and protection for the environment.

We highly recommend that you familiarize yourself with this guide for the installation, commissioning and maintenance of your new system.

The instructions for the maintenance and visual checks of the system will ensure that you have a reliable and long-lasting sewage treatment plant.

Please do not hesitate to contact your BIOROCK distributor for any queries or further assistance. Thank you for choosing BIOROCK.

***READ CAREFULLY***

The installation and commissioning of your ECOROCK TREATMENT UNIT system should be carried out by an ACUANTIA trained and approved installer. Your installer will be able to offer you a maintenance contract. The ACUANTIA Warranty is only valid if the required maintenance is carried out by a ACUANTIA trained and approved installer.

Should you not wish to take out a maintenance contract, make sure you have your sewage treatment plant inspected and maintained on a regular basis by a trained and competent wastewater professional.

**Technology Liscensor**: **BIOROCK® SARL**
4-5 ZAE Le Triangle Vert, L-5691 ELLANGE – Luxembourg
Email: info@biorock.com
Tel: 00 352 26 17 66 33

## North American Distributor / Licensed Manufacturer

## Acuantia / Tank Depot

685 John B Sias Memorial Pkwy, 330
Fort Worth Texas, 76134
View on www.tank-depot.com
https://www.tank-depot.com/p-3895/biorock-wastewater-treatment-units
Tel: 866.926.5603

# A

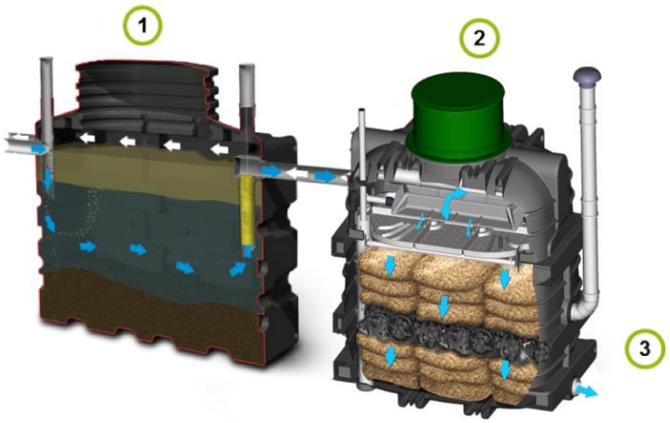
# BIOROCK Technology

## ECOROCK TREATMENT UNITS

Capacity 450/600/750 GPD

# 1. TECHNOLOGY DESCRIPTION

The ECOROCK TREATMENT UNIT system is a Sewage Treatment Plant belonging to the family of Non-Electric Systems. The ECOROCK treatment system consists of a Primary Settling tank and a Treatment tank (" ECOROCK 450/600/750"). The Primary tank must be any properly vented (*see* §B 9.2) and approved septic tank having a minimum volume of 940 gallons. Domestic wastewater is treated according to the well proven principle of a fixed bed of filter media.




The ECOROCK TREATMENT UNIT sewage treatment unit is exclusively designed for domestic wastewater treatment.

1- **The Primary tank**
The raw wastewaters are collected in the Primary Tank where settling solids are accumulated at the bottom (anaerobic digestion) and other floating particles (paper, grease…) are accumulated at the surface. The Primary Tank provides the pre-treatment phase of the process. The ECOROCK TREATMENT UNIT is equipped with two effective effluent filters at the outlet of the Primary Tank before the water goes on to the secondary treatment unit.

2- **The Bioreactor/Treatment Tank ( ECOROCK 450/600/750)**
The ECOROCK TREATMENT UNIT is paired with a Primary Septic Tank to create a " ECOROCK TREATMENT SYSTEM". The ECOROCK TREATMENT UNITS are also available separately for septic repairs and can be paired with any properly vented and approved standard septic tank.

Packed with BIOROCK® media, the ECOROCK treatment plant provides the secondary treatment phase of the process. Inside the ECOROCK Treatment Unit, biological treatment occurs simultaneously (by the biofilm attached to the media) and a filtration process (by the same media). Oxygen used by the biological reactions is provided by the natural ventilation through an aeration layer located at the middle of the BIOROCK® media bed.

The ECOROCK Treatment Units can scale up and down to the customer's needs for use as smaller or larger tanks using the quantity of media to treat the effluent. The media scales to the tank volume in a specific ratio that aligns with the following table. Irrespective of the size tank, the arrangement of the media in the tank is the SAME set of layers as per the diagram above and the sections below. When combined with an appropriately sized septic tank for the flow rates listed below, the ECOROCK Units provide the secondary treatment phase of the process.

| MODEL | Tank Flow Rate (US G/day) | Tank Volume (USG) | Flow to Volume Proportional Ratio | Media Volume (USG) | Ratio Flow rate (US G/day) / Media volume |
|---|---|---|---|---|---|
| **ECOROCK 450** | 450 | 400 | 1.13 | 368 | 1.2 |
| **ECOROCK 600** | 600 | 530 | 1.13 | 491 | 1.2 |
| **ECOROCK 750** | 750 | 660 | 1.13 | 614 | 1.2 |

**3- The discharge options (pump or gravity)**

A pump allows the effluent to be discharged above ground or at disposal field level if site conditions prevent gravity discharge. Natural gravity discharge is the preferred option in cases where suffient grade is available as no electrical connection is required.

| CAPACITY | PRIMARY TANK | FLOW RATE | ORGANIC CONCENTRATION |
|---|---|---|---|
| **3 bedrooms** | 2 compartments with 2 effluent filters | 450 US Gal/day | 200 mg/L of BOD5 |
| **4 bedrooms** | 2 compartments with 2 effluent filters | 600 US Gal/day | 200 mg/L of BOD5 |
| **5 bedrooms** | 2 compartments with 2 effluent filters | 750 US Gal/day | 200 mg/L of BOD5 |

# 2. USAGE

Important precautions for the proper use of the ECOROCK TREATMENT UNIT system:

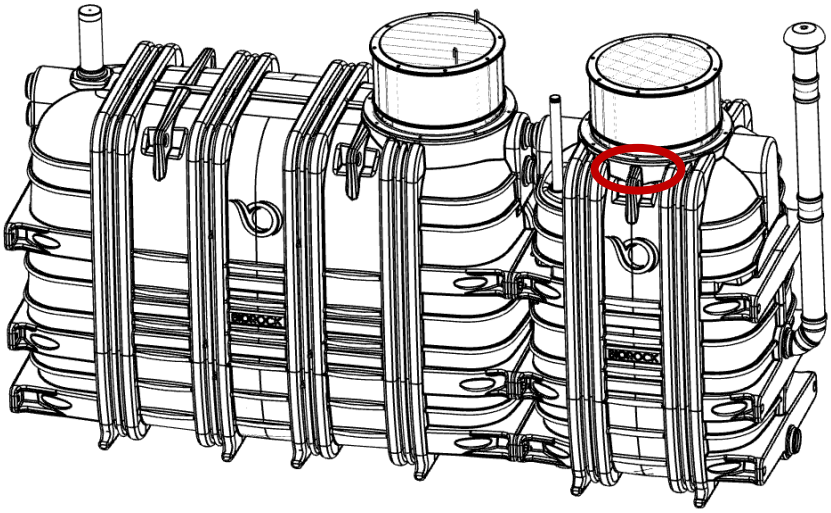
- **Only domestic sewage** should enter the system; no rainwater is allowed.
- To ensure the good working order of the ECOROCK TREATMENT UNIT system, the use of automatic toilet cleaners, electric waste-disposal systems and pumps equipped with blades are not required. In some cases (professional kitchen on site or if **the tank is more than 30ft ~~of~~ from the building**) an efficient and properly sized grease trap should be installed. The grease trap should be installed ahead of the primary tank.
- Kitchen or motor oils, fats, wax, resin, paint, solvents, hydrocarbon-based products (petrol, crude oil etc.), any pesticide or antibacterial product, items of a toxic nature, boiler or air-

conditioning condensate, swimming pool backwash, rainwater, drainage water or groundwater, cigarette butts, women's sanitary items, other paper are forbidden. Any biological activator normally used for septic tank is also forbidden.

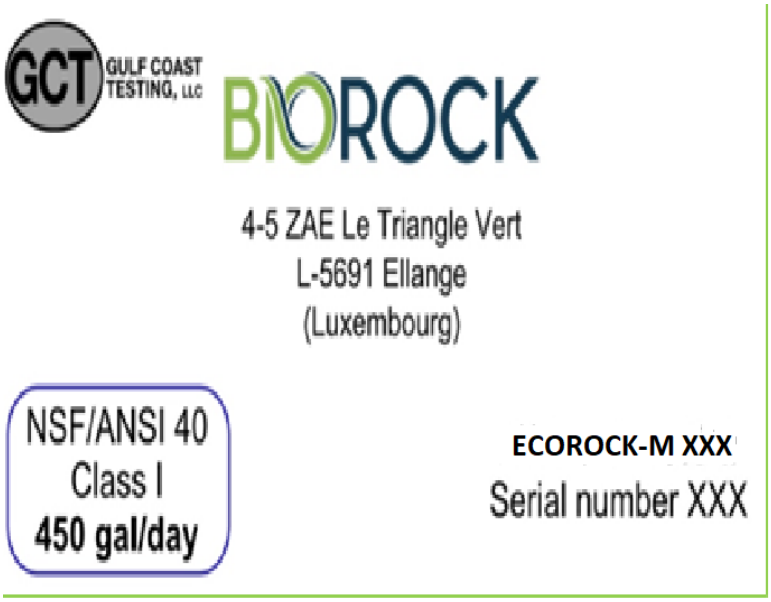
We recommend that pipework at the outlet of the ECOROCK TREATMENT UNIT should allow sampling.

# 3. IDENTIFICATION

Before installing the ECOROCK TREATMENT UNIT, please record the serial number of each tank on the documents to be kept by the final user (Appendix 4 and 5 of this Manual) as shown below:



Primary Tank ECOROCK 450



# B

# HOW TO INSTALL

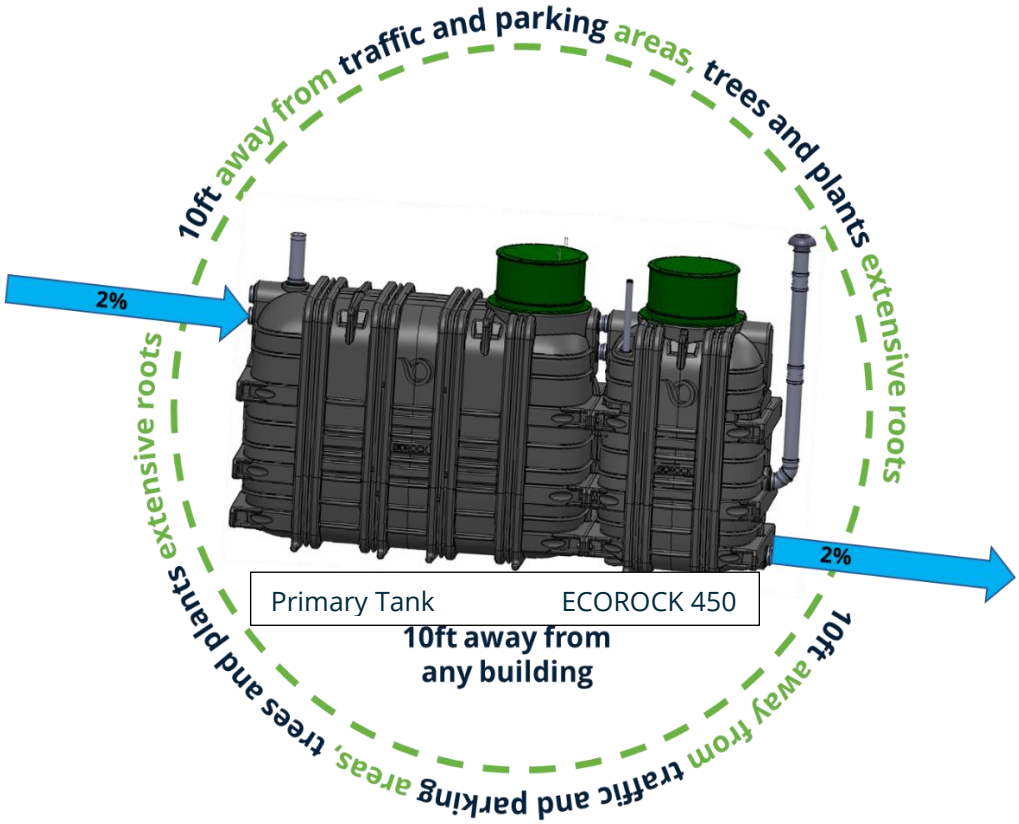
## ECOROCK TREATMENT UNIT

Capacity 450/600/750 GPD

Please note that ACUANTIA shall not be responsible for any installation design parameters and construction in any case. We recommend involving an authorized installer for the installation of our system and following best practices of the industry.

# 1. PLACING ECOROCK TREATMENT UNIT

- Check the tank and associated equipment (options, connections, seals, etc.). Before installation, take in to account technical details for each system.
- A minimum distance of about 10ft from the building and 10ft from trees with extensive roots should be ensured.
- A minimum distance of 10ft from any construction work should be ensured, otherwise the stability of the building should be checked.
- The installation should be located away from any traffic areas and parking (at least 10ft).
- Consult an authorized installer if the units are to be installed deep in the ground. The access to the system must be guaranteed. The maximum height of backfill on the tank is 36".
- Covers should not be buried and should always remain accessible for maintenance.
- Connections are made with flexible seals with a diameter of 4".
- The effluent inlet pipe to the primary tank should have a minimum gradient of 2 % and a maximum of 4%. The outlet pipe of the ECOROCK unit to the discharge point should have the minimum gradient of 2%.
- Install a grease trap if the system is installed 30 ft away from the building.
- The air outlet of the ventilation must be installed less than 50 ft away from the tank.
- Local rules and legislation should be respected.



# 2. EXCAVATION

**Excavation dimensions:**

| | **WIDTH** *(backfilling included)* | **LENGTH** *(backfilling included)* | **Minimum footprint** |
|---|---|---|---|
| **ECOROCK 450** | **4.75 ft** | **5.25 ft** | **25 ft²** |
| **ECOROCK 600** | **4.75 ft** | **6.5 ft** | **34 ft²** |
| **ECOROCK 750** | **4.75 ft** | **8.25 ft** | **40 ft²** |

**The distance between the side of the excavation and the ECOROCK TREATMENT UNIT must be minimum of 12" (1ft).** A stable base must be created at the bottom of the excavation. Mud and other soft materials must be removed from the bottom of the excavation prior to installation.

Ensure that topsoil is put to one side placing on tarp enabling it to be used when finalizing the backfill.

# 3. HANDLING ECOROCK TREATMENT UNIT

Weight of the ECOROCK units: **450:580 lbs; 600:700 lbs; 750:810 lbs**

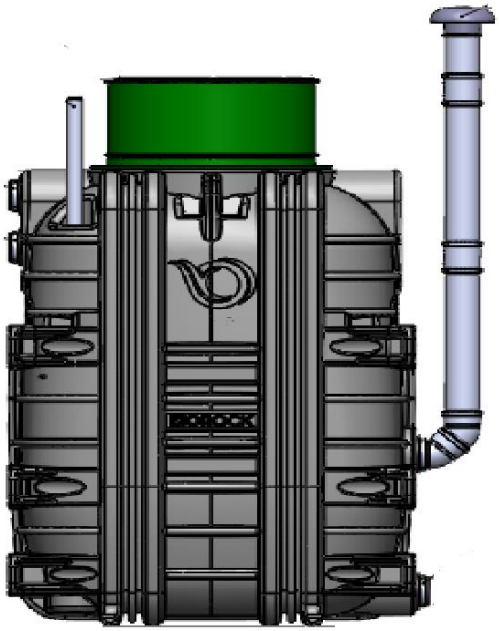
The ECOROCK TREATMENT UNIT must be handled carefully using the four lifting eyes. They are situated on the top of the tank, enabling lifting by crane, forklift or backhoe.
Guarantee the safety rules when lifting the tank.

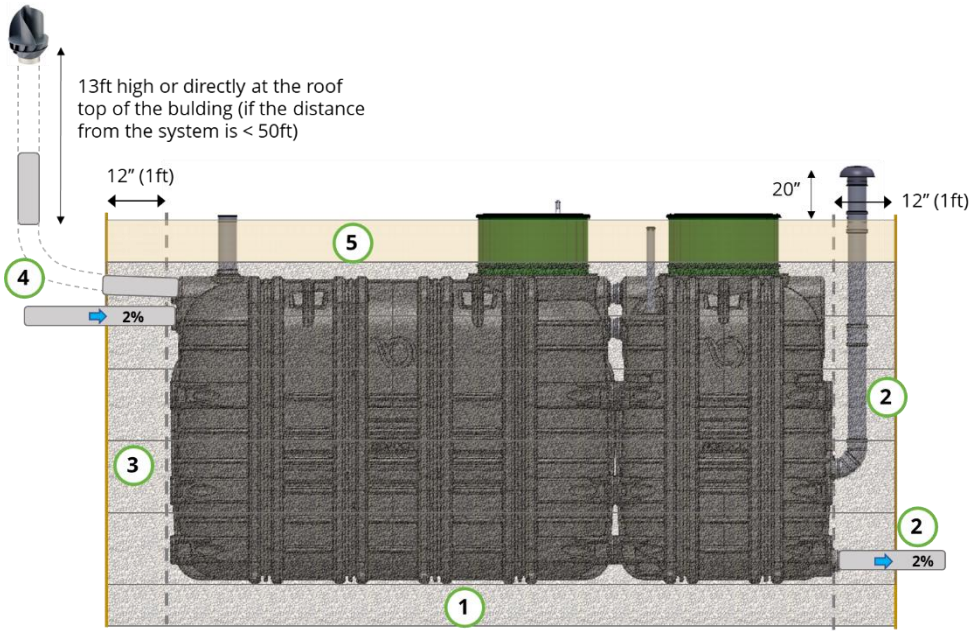
After delivery to the site, the equipment must be transported, stored and handled in such a way that it is protected from any action, particularly mechanical action, which could cause some damages.

# 4. INSTALLATION (DRY CONDITIONS)

**Conditions for installation:**

- Dry and stable ground conditions
- Absence of water at the bottom of the excavation






**1.** Use **pea gravel** (1/4") to create **a base of at least 12"** thickness at the bottom of the excavation. The units must stand on a clean, stable, leveled, and compacted base.

**2.** Place the ECOROCK TREATMENT UNIT horizontally on the base and ensure that the unit is perfectly Installed and stable on the base. Connect the discharged pipe to the outlet of the tank. Ensure that the seals are watertight. The pipe to the discharge point should have a gradient of 2%. Should provide description of pump assembly installation – will be the majority of installs

**Ventilation**: connect the **air inlet pipe vertically at 20"** high from the covers. Plug the cap to the inlet pipe.

**3.** Backfill the hole with **pea gravel** (1/4") while filling the primary tank with water to the same level of 12" high. Compact the backfill manually. Then continue to repeat the above process with 12" of backfill while continuing to fill the tank and compact

manually. Check the level of the tank frequently. Stop once reaching the inlet opening of the primary tank.

**4.** Connect the raw wastewaters pipe from the building to the water inlet of the primary tank. Ensure that the seals are watertight. The pipe should have a minimum **gradient of 2%** Check that all levels are correct so that the wastewater can flow freely through the system.

**Ventilation**: Connect the **air outlet pipe vertically at 13ft high** from the covers. Always use 4" PVC pipe. Plug the wind driven fan or the static fan (depending on the environment conditions) to the outlet pipe. Fix the air outlet pipe to a support to hold the 13ft pipe. Ensure that the seals are watertight.

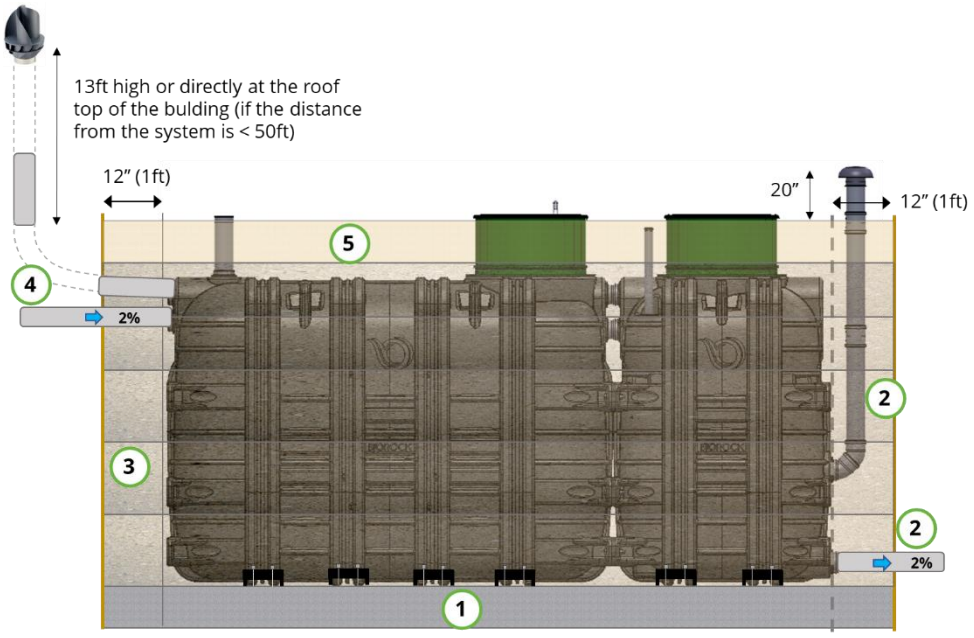
*It's possible to place the air outlet on the roof of a building located at least 15" above ~~roof~~ covers level and at least 3ft away from any windows or skylights on the roof or other pipes (fence, vent...). Always use 4" PVC pipe. The slope of the ventilation pipe to the building should have a gradient of 2% minimum. Do not use 90° elbow to install the upper ventilation (use 45° elbow instead) The distance between the building and the ECOROCK TREATMENT UNIT must be less than 50ft.*

**5.** Once all connections are correctly positioned, keep backfilling with pea gravel. Check the level of the tank once the backfilling is finished. Finalize the **last 8" with the excavated soil** (after removing stones and sharp objects). Always keep the system accessible. The maximum level of topsoil above the backfill is 8". Many installs will be buried 3'.

# 5. INSTALLATION (WET CONDITIONS)

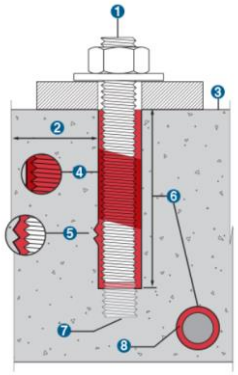
**Conditions for installation:**

- Wet ground (clay soil, ...)
- Presence of high ground water table etc.



**1.** Make a **concrete base of 8"** thickness at the bottom of the excavation. This concrete slab should extend at least 12" all around the tanks. This slab must be calculated by an authorized installer. The units must stand on a clean, stable, leveled, and compacted base.

**2.** Place the ECOROCK TREATMENT UNIT horizontally on the base and ensure that the unit is perfectly Installed and stable on the base. Connect the discharged pipe to the outlet of the tank. Ensure that the seals are watertight. The pipe to the discharge point should have **a gradient of 2%**. Anchoring the ECOROCK TREATMENT UNIT should be secured to the concrete slab with chemical anchors using brackets and spacers.




**Ventilation**: connect the **air inlet pipe vertically at 20"** high from the covers. Plug the cap to the inlet pipe.

**6.** Backfill the hole with **sand mixed with cement** (12 lbs of cement per $ft^3$) while filling the primary tank with water to the same level of 12" high. Compact the backfill manually. Then continue to repeat the above process with 12" of backfill while continuing to fill the tank and compact manually. Check the level of the tank frequently. Stop once reaching the inlet opening of the primary tank.

**3.** Connect the raw wastewaters pipe from the building to the water inlet of the tank. Ensure that the seals are watertight. The pipe should have a **gradient of 2%**. Check that all levels are correct so that the wastewater can flow freely through the system

**Ventilation**: Connect the **air outlet pipe vertically at 13ft high** from the covers. Always use 4" PVC pipe. Plug the wind driven fan or the static fan (depending on the environment conditions) to the outlet pipe. Fix the air outlet pipe to a support in order to hold the 13ft pipe. Ensure that the seals are watertight.

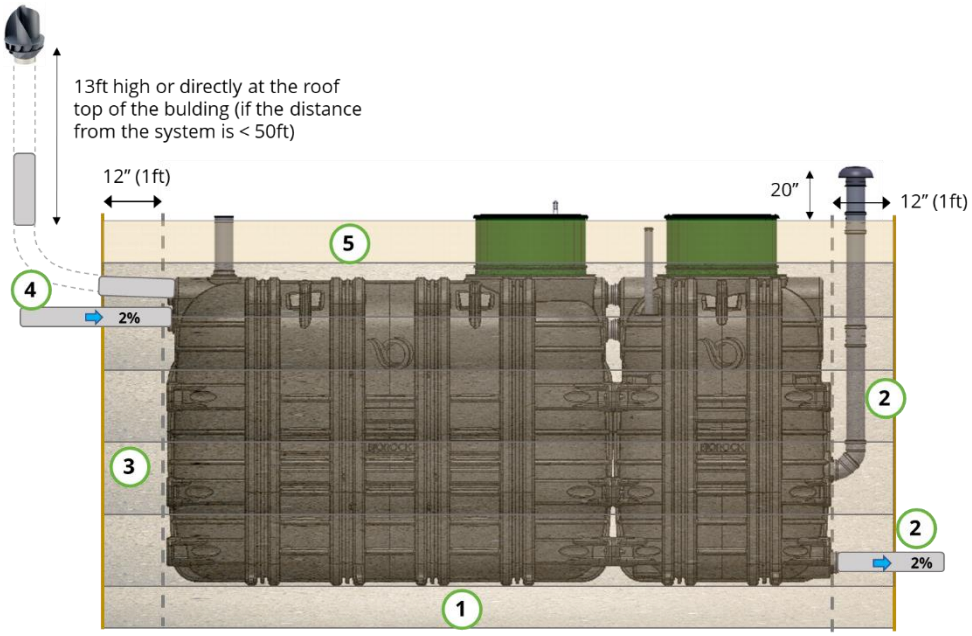
*It's possible to place the air outlet on the roof of a building located at least 15" above roof level and at least 3ft away from any windows or skylights or others pipes (fence, vent...). Always use 4" PVC pipe. The slope of the ventilation pipe to the building should have a gradient of 2% minimum. Do not use 90° elbow to install the upper ventilation (use 45° elbow instead) The distance between the building and the ECOROCK TREATMENT UNIT has to be less than 50ft.*

**4.** Once all connections are correctly positioned, keep backfilling with pea gravel. Check the level of the tank once the backfilling is finished. Finalize the **last 8" with the excavated soil** (after removing stones and sharp objects). Always keep the system accessible. The maximum level of topsoil above the backfill is 8".

# 6. INSTALLATION (DIFFICULT CONDITIONS)

**Conditions for installation:**

- Wet ground (clay soil, ...)
- Presence of high ground water table etc.




**1.** Use **sand mixed with cement** (12 lbs of cement per $ft^3$) to create **a base of 8"** thickness at the bottom of the excavation. The units must stand on a clean, stable, leveled, and compacted base.

**2.** Place the ECOROCK TREATMENT UNIT horizontally on the base and ensure that the unit is perfectly Installed and stable on the base. Connect the discharged pipe to the outlet of the tank. Ensure that the seals are watertight. The pipe to the discharge point should have **a gradient of 2%**.

**Ventilation**: connect the **air inlet pipe vertically at 20"** high from the covers. Plug the cap to the inlet pipe

**3.** Backfill the hole with **sand mixed cement** (12 lbs of cement per $ft^3$) whilst filling the primary decanter with water at the same level for 24" high. Compact the backfill manually. Then repeat the task (24" of backfill whilst filing the tank then compact manually). Check the level of the tank frequently. Stop once achieving the inlet opening of the primary tank.

**4.** Connect the raw wastewaters pipe from the building to the water inlet of the tank. Ensure that the seals are watertight. The pipe should have a **gradient of 2%**. Check that all levels are correct so that the wastewater can flow freely through the system

**Ventilation**: connect the **air inlet pipe vertically at 15”** high from the covers. Always use 4” PVC pipe. Plug the cap to the inlet pipe. Connect the **air outlet pipe vertically at 13ft high** from the covers. Plug the wind driven fan or the static fan (depending on the environment conditions) to the outlet pipe. Fix the air outlet pipe to a support in order to hold the 13ft pipe. Ensure that the seals are watertight.

*It’s possible to place the air outlet on the roof of a building located at least 15” above roof level and at least 3ft away from any windows or skylights or others pipes (fence, vent…). Always use 4” PVC pipe. The slope of the ventilation pipe to the building should have a gradient of 2% minimum.* ***Do not use 90° elbow*** *to install the upper ventilation (use 45° elbow instead) The distance between the building and the ECOROCK TREATMENT UNIT has to be less than 50ft.*

5. Once all connections are correctly positioned, keep backfilling with pea gravel. Check the level of the tank once the backfilling is finished. Finalize the **last 8” with the excavated soil** (after removing stones and sharp objects). Always keep the system accessible. The maximum level of topsoil above the backfill is 8”.

# 7. UNDER ROADS, COURTYARDS OR STORAGE AREAS

For an installation under roads, courtyards or storage areas, **a distribution slab of reinforced concrete should be constructed and placed above the tank.**

- The concrete slab must be constructed in such a way that it does not rest on the tank
- The edges of the slab must rest on the surrounding ground; the ground must be stable. If unstable ground, specific foundations should be built
- For these foundations, the thickness of the slab distribution, the access to the lids of the tanks, the unit and sampling pipe, the reinforcement and the structure of the slab, etc., will be **specified by an authorized installer**, based on expected traffic loads and the nature of the soil.
- The access to the covers (both for the primary tank and the treatment unit), the PVC pipe to access to the water inlet of the primary tank and the air inlet of the treatment unit must be provided by openings included in the concrete slab. The slab opening above the air inlet cannot be airtight (air from outside must flow to air inlet cap).

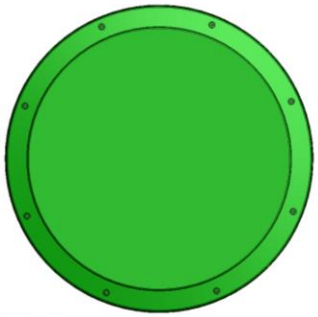
# 8. COVER / RISER

**COVER:**

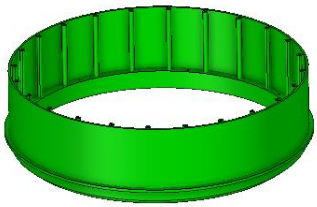
The ECOROCK TREATMENT UNIT has two 24” covers: one placed at the outlet of the primary tank and one centered at the treatment unit. Screws (8) are used to fix the cover to the tank.

**RISER:**

The ECOROCK TREATMENT UNIT includes two risers: one placed at the outlet of the primary tank and one centered at the treatment unit. Each riser is 12" high.



Screws (8) are used to fix the riser to the tank adaptor.



It's possible to **add another 12" riser** on the top of the existing one.

# 9. START-UP

Once the installation is completed, the commissioning of the system must be carried out as soon as raw wastewater flows into the ECOROCK TREATMENT UNIT. This operation must be carried out by the installer as follows:

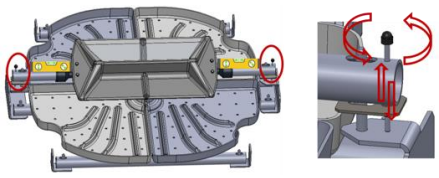
### 1- CHECKING THE DISTRIBUTION FLOW

*In the presence of wastewater, make sure to comply with the safety instructions (see §C.1).*

1.1 Check that the water is flowing correctly into the primary tank. The inlet must not be clogged by any solids or objects and the effluent filter must be properly positioned as shown below.

1.2 Check that the seal of the 4" feeding pipe of the treatment unit is not leaking.

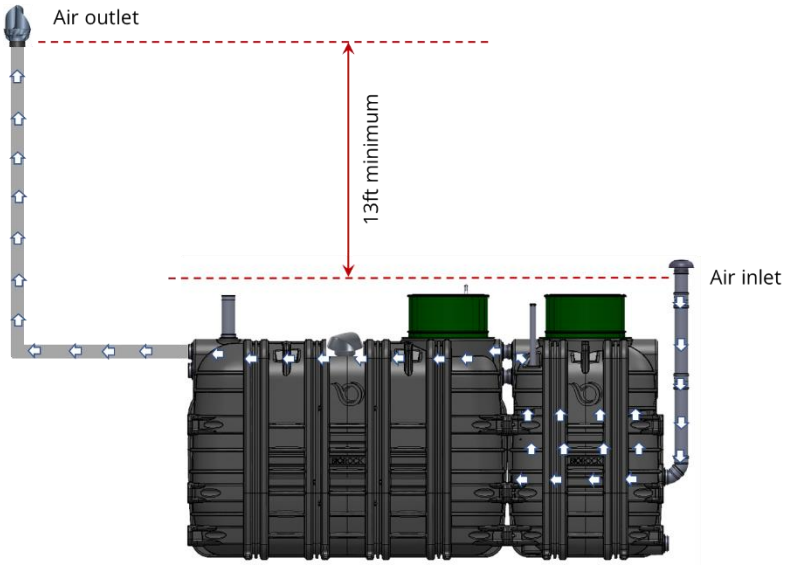
1.3 Check that the tipping tray is working correctly. Make sure that it's tipping several times. The pretreated water flushed by the tipping tray should be evenly distributed on all the holes of the distribution plate. No overflow out of the distribution plate should be observed. Check that the tipping tray is level. If this is not the case, adjust the 2 rodsllocated at the ends of the tipping tray.



1.4 Check the treated water flow at the treatment compartment outlet through the sampling chamber or the pumping station.

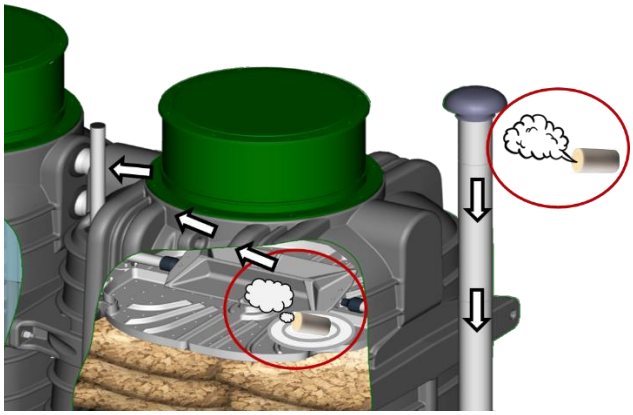
## 2- VENTILATION

The ECOROCK TREATMENT UNIT must be ventilated. Make sure that the ventilation is functional by performing a **smoke test** [(1)]. **Do NOT use** 90° PVC elbow on the PVC upper ventilation line use **ONLY** 45° elbow instead. Depending on the conditions of the location environment (wind exposure), it is recommended to install a wind driven fan. The upper and lower vents should be in an open area (tree at more than 10ft). The lower ventilation is placed at > 20" from the ground. The height difference between the upper and lower ventilation must be > 13ft.




(1) **Smoke testing** is the best approach to ensure the treatment unit(s) is functioning properly. The test consists of placing a smoke cartridge at the air inlet (lower ventilation) and observing the smoke flow at the outlet (upper ventilation). Within 2-3 minutes, smoke should be visible at the air outlet.

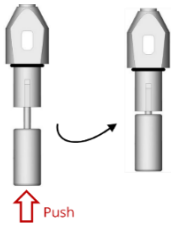
Do not place the smoke cartridge directly on the surface of the system components (PVC pipe, tipping tray, media, ...). Use a resistant support (ceramic plate, metal cover, glass, ...) to put it on a flat surface (e.g. on the distribution plate) or use a clamp to keep it close to the air inlet ventilation cap. Once the smoke generator is ignited, close all the covers to keep everything airtight.



Achieving efficient ventilation is the responsibility of the installer as he is familiar with the installation site and local conditions that may interfere in the system's venting.

**3- ALARM** *(see appendix 6: alarm technical sheet)*

An electrician must connect the alarm to the building electrical panel then turn on the alarm. Make sure that it is well connected and test if the sound and the red light are working when the float of the alarm is up.




**4- ACCESSIBILITY**

Accessibility to the system and all the covers must be ensured at all times. After commissioning, all covers must be secured (use the screws to close the cover).

**After commissioning the system, fill in the maintenance form (Appendix 4) to complete the tasks done during the start-up.**

# 10. CONFORMITY AND WORK COMPLETION

In all cases, the owner and the installer will jointly complete the warranty activation form for ECOROCK TREATMENT UNIT (Appendix 5) and send it back to the manufacturer by email biorock@acuantia.com or by filling the form on our website www.acuantia.com. Once completed, this document validates the warranty of the system when received by the manufacturer.

# 11. COMPLIANCE WITH REGULATIONS AND STANDARDS

The ECOROCK TREATMENT UNIT complies with all requirements of NSF/ANSI Standard 40 Class I and the Construction Product Regulations.

Performance tests for the NSF/ANSI standards of ECOROCK TREATMENT UNIT were produced and validated by the US Platform notified as **GCT**, Gulf Coast Testing, LLC an ANSI accredited product certification company located in Baton Rouge, Louisiana.

# 12. WARRANTY

**10 years warranty on the media*1**
**25 years warranty on the tank*2**

**1 The 10 years warranty shall only apply if the annual maintenance is carried out by a BIOROCK approved installer or supervised by a trained BIOROCK Certified professional*

**2 The 25 years warranty shall only apply if the installation is carried out by a BIOROCK approved installer or supervised by trained BIOROCK Certified professional*

The equipment and accessories produced at the ACUANTIA factory are guaranteed not to have any manufacturing defects. The equipment and accessories must be transported, stored and handled in such conditions that they are not damaged and do not deteriorate. The ECOROCK TREATMENT UNIT units should never be laid on their side. In case of bad shipment or other damage, the BIOROCK Media should be re-placed correctly as shown in the User Guide.

In the case of incomplete delivery (missing equipment or accessories) or damage observed on delivery, these remarks / observations should be listed on the carriers delivery note or bill. The carrier and the supplier must be informed within 48 hours or 2 business days.

In case of malfunction or construction defect acknowledged by the supplier, the warranty is limited to the replacement of defective parts, excluding all other costs involved. The defective equipment and accessories will be repackaged in their original packaging (if any) and will be made available to the manufacturer.

The warranty will not apply if:

- Failure to correctly size the sewage treatment plant;
- Failure to follow either the installation requirements or the manufacturer's recommendations for the use and maintenance of the primary tank and its pre-filter, as specified in the user's guide (including emptying instructions - constant level);
- Failure to follow either the installation requirements or the manufacturer's recommendations for the use and maintenance of the treatment unit, as specified in the user's guide
- Non-compliance with other requirements of regulations and standards in force;

- Damage caused by accidental or climate events beyond our control.

The owner of the treatment unit must complete the installation form (Appendix 5 in the User's Guide) to benefit from the "Manufacturer's Warranty".

The owner must complete the maintenance form (Appendix 4 in the manual) and keep it up-to-date by adding any maintenance and commissioning activity carried out on the ECOROCK TREATMENT UNIT Sewage Treatment Plant.

Follow the maintenance instructions and visual controls to maintain a reliable and durable system. Please contact your dealer with any question.

# C

# HOW TO MAINTAIN

## ECOROCK TREATMENT UNIT

Capacity up to 450/600/750 GPD

# 1. SAFETY INSTRUCTIONS

*Related to the Commissioning and operation of BIOROCK® compact wastewater treatment systems.*

**BIOLOGICAL RISK**

- **It is mandatory to avoid any contact with the effluents.** The operator must wear individual protection gear (waterproof gloves, protective overalls, safety glasses and safety shoes) and must keep disinfectant products nearby. Even treated wastewater contains microbial fecal germs (bacteria that are responsible for serious diseases).

*In case of direct contact with the skin, rinse the affected area thoroughly with clean water and apply a disinfectant. Please seek medical advice from your general practitioner.*

- **It is strictly forbidden to reuse treated water** for any application involving a risk of direct or indirect human contact *(washing, surface irrigation, underground irrigation for garden growing vegetables, discharge into a pond or lake, etc.).*

**CHEMICAL RISK**

- Do not smoke near the tanks during all the operations described in this manual.


- Do not open the covers without first taking all the necessary safety measures (breathing apparatus, degassing of the tanks, etc.). Biological reactions that take place in the primary tank (fermentation) produce gases (particularly hydrogen sulphide $H_2S$ and methane $CH_4$) that can be toxic in high concentrations (especially when the system's ventilation is not functional).

- For the reasons explained above, it is forbidden to enter the tank.

**PHYSICAL RISK**

- When the presence of a pumping station is necessary to discharge the treated water, operations on the electromechanical equipment (pump, control panel) must be carried out by a qualified professional for electrical work.

**MECHANICAL RISK**

- It is forbidden to drive or park within 10 feet of the tanks' perimeter.

- Access to manholes and system covers is mandatory for maintenance operations, both for the primary compartment (24" diameter) and for the treatment unit (24" diameter). It is forbidden to leave any load on the covers.

- The covers are secured with screws, make sure that the screws are always airtightened for the safety of all.

- Never leave the tank open when working. Covers must be secured after every operation.

- Do not walk, park or pile loads on the cover.

- While installing the tank, use straps around the tank lifting eyes. Make sure that no one is in the maneuvering area, and do not position yourself under the load

# 2. ANNUAL MAINTENANCE

**Acuantia After Sales Service (biorock@acuantia.com)** offers its expertise for the maintenance of your system, allowing you to be in contact with our technical team. It is highly recommended to hire a specialized professional for the maintenance work on your wastewater treatment plant. Your distributor and/or your installer will advise you on how to set up a maintenance contract.

To ensure that the system's performance is maintained throughout the years, it is essential to follow on a regular basis the maintenance and usage recommendations described below from §1. to §9. and §A.2 for the usage.

For any annual maintenance, fill in the maintenance form (Appendix 4).

For safety instructions, please refer to §C.1.

### 1- General visual inspection of the plant

- The ECOROCK TREATMENT UNIT must be easily accessible
- All covers must be clear and accessible with no loads placed on them
- **Check the flow throughout the entire system**:
  - ✓ After opening the two 24" covers, make sure that the system receives enough raw wastewater *(flush the toilet several times or let a shower or tap run for a few seconds)*
  - ✓ Check that raw wastewater flow correctly by gravity to the primary tank. No large solids or objects should clog the pipe
  - ✓ Check the flow at the primary tank outlet and make sure that the two prefilters are at the right position (the top of the prefilter has to be at the water level)

- ✓ Make sure that the water entering the treatment unit feeds the tipping tray and that the treated water is evenly distributed on the distribution plate. See **§B 9.1**
- ✓ Check the treated water flow at the treatment unit outlet through the sampling chamber or the pumping station

- Check the PVC pipes for water leakage (around the seals)

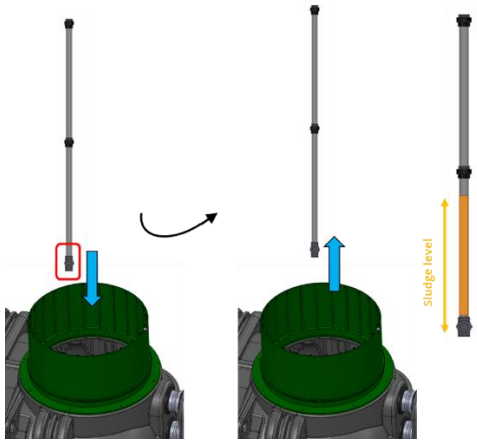
## 2- Wastewater sampling at the primary tank outlet

- Check (visually) the water quality of the primary tank wastewater.
- Take a sample of water *(for safety instructions, please refer to §C.1. for any operation involving wastewater)* at the primary tank outlet. Use a clean glass container.
- Water should be light brown, brown or yellow, turbid to very turbid, but there should be few particles visible at the bottom of the glass after letting the sample settle down for 20 minutes. The collected wastewater may have a slight septic odor.

## 3- Measuring sludge level in the primary tank

Sludge measurement is required to assess the exact sludge level in the tank to accurately determine how often the tank should be emptied. The tool used for the measurement is a **PVC sludge pipe** with a metric scale and a reverse check valve. *(see §C.1 for safety instructions for operations involving wastewater)*

- Assemble the parts of the sludge pipe together
- Insert the pipe at the primary tank outlet (the side with the check valve must be first immersed into the water)
- Once the bottom of the tank is reached, pull up the sludge pipe.
- Let it settle for 20 minutes and write down the sludge level.



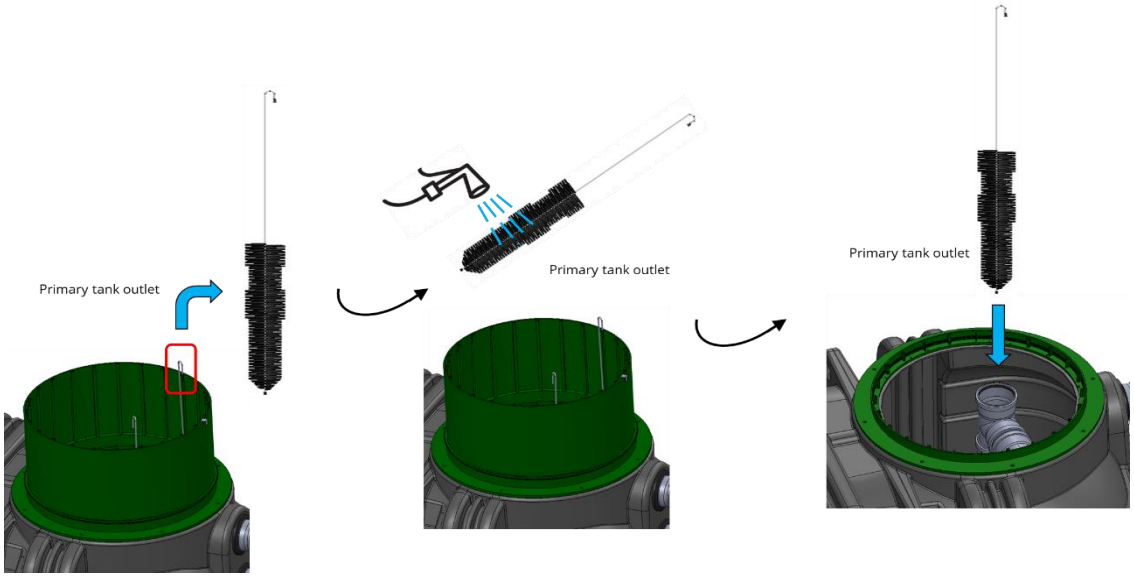

Emptying must be done when the sludge level reaches **50%** of the water level **= 28”**.

Call in an approved tank cleaning contractor to carry out the emptying operations. Disposal of the sludge must be carried out in accordance with the regulations. It is advisable to clean the tank walls with a pressurized water jet to remove all grease and substances that have accumulated on the walls. This operation should be done by the contractor. The primary tank must be immediately fill in with water after the cleaning. Note that the truck should not be parked less than 10ft from the ECOROCK TREATMENT UNIT.

The amount of sludge produced is influenced by the usage of the system (depending on the sizing of the system, the frequent pollution overloads, the effluents characteristics, or the routine maintenance). Each system has its own specific usage. Therefore, **the sludge measurement method described above is the most reliable way to determine when it is required to empty the primary tank.**

## 4- Cleaning the effluent filters of the primary tank

- Open the 24" cover and gently pull one of the effluent filter up by the rod to take it out. *See §C.1 for safety instructions for operations involving wastewater.*
- Clean the effluent filter with a water jet above the 24" manhole.
- Put the effluent filter back into the PVC pipe, making sure to put it back in its original position
- Repeat the operation for the second effluent prefilter



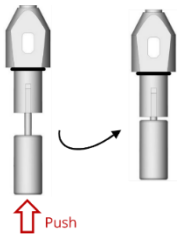

## 5- Wastewater sampling at the treatment unit outlet

- Check the treated water quality visually *(if the flow is not sufficient, you may have to flush the toilet or open a tap to generate a flow)*
- Sampling can be done through a sampling chamber, either directly from the pumping station if installed, or at the effluent outlet when accessible *(see §C.1 for safety instructions for operations involving wastewater)*
- Use a sampling tool with a telescopic handle or a flexible hose connected to a water pump fixed on a drill to take the sample. It is important to take the sample halfway up (not on the surface or at the bottom) and not to stir water when taking the sample from a manhole or a pump station.
- After letting the sample stand for 20 minutes, water should be clear with minimal particles visible at the bottom. Water should not have a septic or foul smell. It may have a typical smell of fresh humus.

## 6- Alarm inspection

In case of a problem with normal flow, water may rise up in the tank and the high water alarm will emits a sound, and a red light appears.

- Lift up the alarm float slightly (the float is at the bottom of the 2" PVC pipe).
- Push the float to check if the sound and the red light from the alarm are working.




## 7- Checking and adjusting the treatment unit's distribution system

*If the flow is not sufficient, you may need to flush water from the toilet or open a tap to increase the flow.*

- Make sure that the water coming out of the primary tank flows by gravity to the tipping tray. No leak should be observed around the seal of the 4" pipe.
- Pull out the tipping tray and clean it with a water jet above the primary tank manhole.
- Pull out the distribution plate (the plate has 4 parts) and clean them with a water jet above the primary tank manhole
- Put back first the 4 parts of the distribution plate and then the tipping tray.
- Check that the tipping tray is working correctly. Make sure that it's tipping several times. The pretreated water flushed by the tipping tray should be evenly distributed on all the holes of the distribution plate. No overflow out of the distribution plate should be observed.

  Check that the tipping tray is level. If this is not the case, adjust the 2 rods located at the ends of the tipping tray. (**see §B.9.1.3**)

## 8- Media inspection

- Pull out the tipping tray and all the sections of the distribution plate
- Check visually the condition of the BIOROCK® media *(see §4.1 for safety instructions when working with wastewater)*. No water stagnation or dense clogging should be observed on the surface (good flow through the filtering media). If the BIOROCK® media surface appears to be clogged, remove the clogged media bag and clean it with a water jet above the primary tank opening. Replace the media bags in their original position.

- The media should not appear to be packed. If media bags are damaged or tightly packed, they must be replaced.

Make sure to write down your observations in the maintenance form (Appendix 4).

In case of clogging, settling or stagnation, please contact BIOROCK Acuantia after-sales services www.biorock@acuantia.com

### 9- Checking the proper functioning of the ventilation system

Follow the procedure described in point 2 of commissioning **§B.9.2**

# 3. TROUBLESHOOTING

Performance of the ECOROCK TREATMENT UNIT will last for a long time, provided that you follow the instructions for installation, use and maintenance.

In case of malfunction of your system, please refer to the table below and contact our after-sales department , your installer and the distributor of our system. Provide the serial number of the tank that requires a maintenance action. For any actions on the system, fill in the maintenance form (appendix 4).

For all operations involving possible contact with wastewater, please refer to the safety instructions, see **§C.1**

### 1- PRIMARY TANK

| Possible causes | Actions |
|---|---|
| **Bad odors** | |
| ◆ Seals of the ventilation system are not airtight.<br>◆ Seals of the wastewater system from the discharge points (sink, WC, baths, showers, various siphons, etc.) to the primary tank are not waterproofed.<br>◆ Seal on the 24" cover is not airtight.<br>◆ Poor ventilation (ventilation pipe with a diameter < 4", bad positioning of the extractor, 90° elbow, etc.).<br>◆ Restriction of air ventilation inside the tank, e.g. due to the presence of a thick layer of grease and floating substances. | ◆ Check for leaks in the ventilation and sewage network from the building to the primary tank.<br>◆ Check that the covers are properly secured and undamaged.<br>◆ Check for the presence of sealing joints in the covers.<br>◆ Perform a smoke test<br>◆ Measure the sludge level (also measure the level of grease and floating particles on the surface) |
| **Poor water quality or presence of suspended solids** | |
| ◆ Hydraulic overload: excessive water flow through the plant.<br>◆ Under-sizing of the primary tank compared to its regular use.<br>◆ Unusual discharge of harmful, toxic or bactericidal, non-biodegradable products in the system<br>◆ Maximum sludge level exceeded<br>◆ The maintenance of the system was not performed (at least once a year) | ◆ Make sure that there is no rainwater network connected to the plant.<br>◆ Make sure that surface water does not flow into the system (check the seals of the covers).<br>◆ Make sure that water consumption is equal to or less than the daily flow rate expected for the system.<br>◆ If a pump is installed upstream, make sure that the pump capacity is compatible with the daily flow rate<br>◆ If a grease trap is installed upstream, make sure that it is sized according to the best practices, that its maintenance is ensured and that it is emptied regularly as required.<br>◆ If needed, call on an approved tank cleaning contractor to empty the primary tank |
| **Backflow to the building** | |

| | |
|---|---|
| Clogging at the primary tank inlet (no or low flow of raw wastewater at the inlet) | ◆ Open the PVC cap to have access to the primary tank inlet.<br>◆ Check if the PVC Y fitting inlet is clogged. Clean, if needed, with a water jet.<br>◆ If no flow is observed after cleaning the y-branch inlet, call a specialized company for a camera inspection and a complete cleaning of the wastewater inlet pipe. |
| Clogged effluent filter<br><br>The Effluent filter not working<br>(The brush bristles are flattened in the center or damaged or the holding rod is broken). | Clean the effluent filters (see 4-Cleaning of the effluent filter **§C.2.4**)<br><br>Change the effluent filter (see 4-Cleaning of the effluent filter **§C.2.4**)<br>◆ Open the 24" cover to have access to the effluent filter.<br>◆ Pick up the rod holding the effluent filter in the PVC tube and pull it out slowly.<br>◆ Insert the new effluent filter back into the PVC pipe, and make sure to place it in the right position (see **§C2.1**)<br>◆ If your notice that the holding rod is broken, check the ventilation (see 2-Ventilation **§B.9.2**). Gases produced by the fermentation reactions in the tank can build up in high concentrations due to the lack of functional ventilation and corrode the rod. |

## 2- TREATMENT UNIT

| **Bad Odors** | |
|---|---|
| Possibles causes | Actions |
| ◆ Malfunction of the primary tank (see table above **§C.3.1 Primary tank**)<br>◆ Poor ventilation (ventilation pipe diameter < 4", poor positioning of the extractor, 90°elbow, insufficient height difference between upper and lower ventilation, blocked air inlet etc.)<br>◆ Malfunction of the treatment unit's biological reactor caused by a hydraulic overload or a pollution overload > the sizing recommended by the engineering consultant<br>◆ Unusual discharge of harmful, toxic or bactericidal, non-biodegradable products in the installation.<br>◆ Annual maintenance was not performed | ◆ Make sure that the installation, maintenance and usage recommendations of the system are followed.<br>◆ Make sure that the design recommendations given by the engineering consultant have been followed.<br>◆ Make sure that the primary tank performs (see table above **§C.3.1 Primary tank**)<br>◆ Make sure the ventilation is working properly (see 2-Ventilation **§B.9.2**)<br>◆ Check the media condition (see 8-Media inspection **§C.2.8.**)<br>◆ Make sure that the maintenance is performed every year |
| **Different quality and/or presence of suspended solids in the treated wastewater** | |
| ◆ A hydraulic or organic overload (one-off or permanent) on the wastewater treatment system<br>◆ Unusual discharge of harmful, toxic or bactericidal, non-biodegradable products in the system<br>◆ Repeated malfunctions of the primary tank (late emptying, effluent filter not clean, etc.) can lead to the congestion of the treatment unit with sediments or suspended solids.<br>◆ Non-functional ventilation | ◆ Make sure that the design recommendations given by the engineering consultant have been followed.<br>◆ Make sure that the primary tank performs (see table above **§C.3.1** Primary tank)<br>◆ Make sure that the ventilation is working properly (see 2-Ventilation **§B.8.2**)<br>◆ Check the flow in the treatment unit, particularly the distribution by the tipping tray (see **§C.2.7**) |

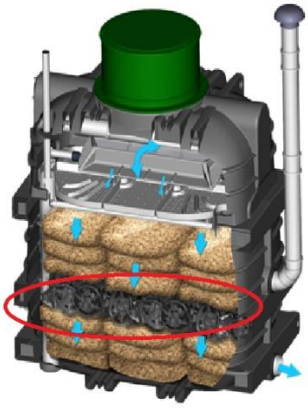
| | |
|---|---|
| ◆ Poor distribution of the pre-treated effluent by the distribution system<br>◆ Pumping station downstream not adapted or not maintained<br>◆ Annual maintenance not performed | ◆ Check the media condition (see 8-Media inspection **§C.8.2**)<br>◆ If a pump is installed downstream, make sure that the pump capacity is compatible with the hydraulic peak flow<br>◆ Make sure that maintenance is performed annually |
| **Water stagnation, clogging or packed media** | |
| The BIOROCK® media can become clogged or/and packed gradually in case of malfunction:<br>◆ A hydraulic or organic overload (one-off or permanent) on the treatment system<br>◆ Unusual discharge of harmful, toxic or bactericidal, non-biodegradable products in the installation<br>◆ Repeated malfunctions of the primary tank (late emptying, sludge discharge, etc.) can lead to the congestion of the treatment unit with sediments or suspended solids.<br>◆ Non-functional ventilation<br>◆ Poor distribution of the pre-treated effluent by the distribution system<br>◆ Annual maintenance not performed | ◆ Make sure that the design recommendations given by the engineering consultant have been followed.<br>◆ Make sure that the primary tank performs (see table above **§C.3.1** Primary tank)<br>◆ Make sure that the ventilation is working properly (see 2-Ventilation **§B.8.2**)<br>◆ Check the flow in the treatment unit, particularly the distribution by the tipping tray (see **§C.2.7**)<br>◆ Check the media condition (see 8-Media inspection **§C.2.8**)<br>If the findings show that the BIOROCK® media is damaged or completely clogged, proceed to its replacement (see below **1-Replacement of the BIOROCK® media**)<br>◆ Make sure that the maintenance is performed annually. |
| **The alarm is up** | |
| ◆ Clogging of the infiltration system or gravity discharge downstream of the ECOROCK TREATMENT UNIT<br>◆ The unit installation is not correct according to the typology of the terrain (leading to cracking/deformation of the tank, ...)<br>◆ Water rising in the outlet (pit, river, ...)<br>◆ Blocked, clogged or broken discharge pipe<br>◆ Malfunction of the pumping station (lifting pump not functioning, check valve or floating device not working)<br>◆ Pumping station not adapted or not maintained | ◆ Make sure that the water table does not exceed the water level of the unit (see **Appendix 1** Technical Drawing)<br>◆ Make sure that the installation recommendations have been followed according to the typology of the terrain (see **§B.** Installation)<br>◆ Make sure that the pump sizing fits the hydraulic peak flow and the discharge height/length required to reach the outlet<br>◆ Replace the lifting pump or the floater<br>◆ Release the check valve<br>◆ Check the flow at the treated water discharge point (rise of water in the pit or the receiving collector, etc.) and the condition of the discharge pipe (obstruction, blockage, etc.). |

## 1- Replacement of the BIOROCK® media

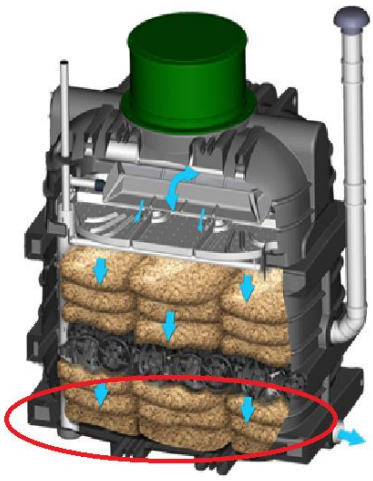
For all operations involving possible contact with wastewater, please refer to the safety instructions, see **§C.1**

1. Open the treatment unit covers by unscrewing the safety screws
2. Pull out the tipping tray and the 4 sections of the distribution plate
3. Take out the top layer BIOROCK® media bags. **When handling the media, use a metal hook to clip the net that hold the media.**

4. Take out the middle aeration layer of plastic media (polyethylene ring) and keep them aside.



5. Take out the bottom layer BIOROCK® media bags



6. Clean the bottom and sides of the tank by water jet
7. Dispose of the BIOROCK® media bags. **BIOROCK® media should be handled as a mineral substrate waste and disposed of by a licensed company.**
8. Clean the polyethylene ring with water jet above the primary tank manhole.
9. Install the new BIOROCK® media bags at the bottom first.
   → When placing the bags, make sure that each layer of bags covers the entire surface of the unit, leaving no gaps between them.
10. Put back the polyethylene rings
11. Install the new BIOROCK® media bags at the top
    → When placing the bags, make sure that each layer of bags covers the entire surface of the unit, leaving no gaps between them

| | Top layer of BIOROCK® media | Plastic layer Layer | Bottom layer of BIOROCK® media |
|---|---|---|---|
| **ECOROCK TREATMENT UNIT** | 3 layers of bags | 1 layers of rings (around +/- 1ft) | 3 layers of bags |

12. Put back first the sections of the distribution plate and then the tipping tray
13. Make sure that the tipping tray is leveled and that the water is evenly distributed (see point **§B.9.1.3**)
14. Make sure that the covers are secured at the end of the operation.

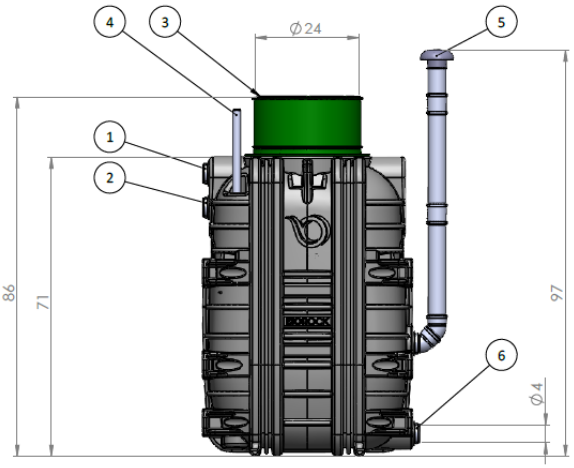
# 4. COMPONENT SERVICE LIFE

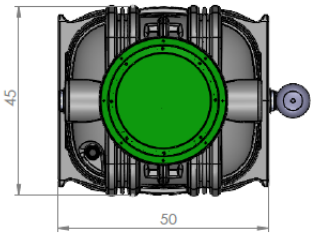
Wear parts are listed in the table below.

| SPARE PARTS | SERVICE LIFE |
|---|---|
| **PP-PVC accessories** | **50 years** |
| **Effluent filter** | **10 years** |
| **Media** | **10 years** |
| **Polyethylene ring** | **50 years** |
| **Cover** | **50 years** |
| **Pump (not approved)** | **2 years** |
| **Wind driven fan** | **50 years** |

# APPENDIX 1 ECOROCK Treatment Unit Drawings

## ECOROCK 450
## Treatment Unit 400 gallons



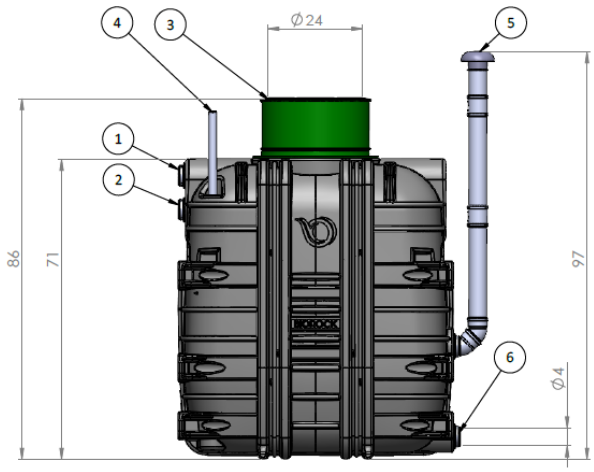



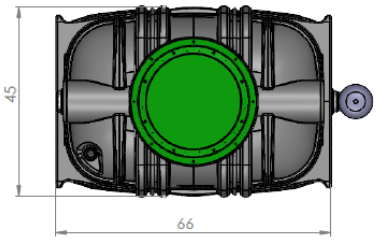

| | |
|---|---|
| 1 | AIR OUTLET |
| 2 | WATER INLET |
| 3 | LIDS |
| 4 | ALARM |
| 5 | AIR INLET |
| 6 | WATER OUTLET |

| CARACTERISTICS | VALUE | UNIT |
|---|---|---|
| Capacity (daily volume per day) | 450 | Gallons/day |
| **SECONDARY TREATMENT** | | |
| Volume | 400 | Gallons |
| Media volume | 368 | Gallons |
| **SPECIFICATION** | **VALUE** | **UNIT** |
| Overall length | 50 | Inches |
| Treatment area | 1270 | Sq inches |
| Overall width | 45 | Inches |
| Overall height | 86 | Inches |
| Overall height + air inlet | 97 | Inches |
| Total weight | 580 | lb |
| Pipe diameter | 4'' | Inches |
| Lid diameter | 24'' | Inches |

| REVISION | DESCRIPTION | NOM DATE | Création NOM: TC DATE: 02/12/2021 | Vérification NOM: TC DATE: 02/12/2021 | TITRE: FT-00092 ECOROCK 450 Treatment Unit 400 gallons |
|---|---|---|---|---|---|
| | | | Rev: 0 | Echelle: Scale: 1:20 | Page: Sheet: 1/1 A3 |

# ECOROCK 600
## Treatment Unit 530 gallons




| | |
|---|---|
| 1 | AIR OUTLET |
| 2 | WATER INLET |
| 3 | LIDS |
| 4 | ALARM |
| 5 | AIR INLET |
| 6 | WATER OUTLET |

| CARACTERISTICS | VALUE | UNIT |
|---|---|---|
| Capacity (daily volume per day) | 600 | Gallons/day |
| **SECONDARY TREATMENT** | | |
| Volume | 530 | Gallons |
| Media volume | 491 | Gallons |
| **SPECIFICATION** | **VALUE** | **UNIT** |
| Overall length | 66 | Inches |
| Treatment area | 1830 | Sq inches |
| Overall width | 45 | Inches |
| Overall height | 86 | Inches |
| Overall height + air inlet | 97 | Inches |
| Total weight | 700 | lb |
| Pipe diameter | 4" | Inches |
| Lid diameter | 24" | Inches |

| REVISION | DESCRIPTION | | | |
|---|---|---|---|---|
| | | Création | BIOROCK | |
| | | NOM: TC | TYPE: FT-00093 ECOROCK 600 Treatment Unit 530 gallons | |
| | | DATE: 02/12/2021 | | |
| | | Vérification | | |
| | | NOM: TC | | |
| | | DATE: 02/12/2021 | | |
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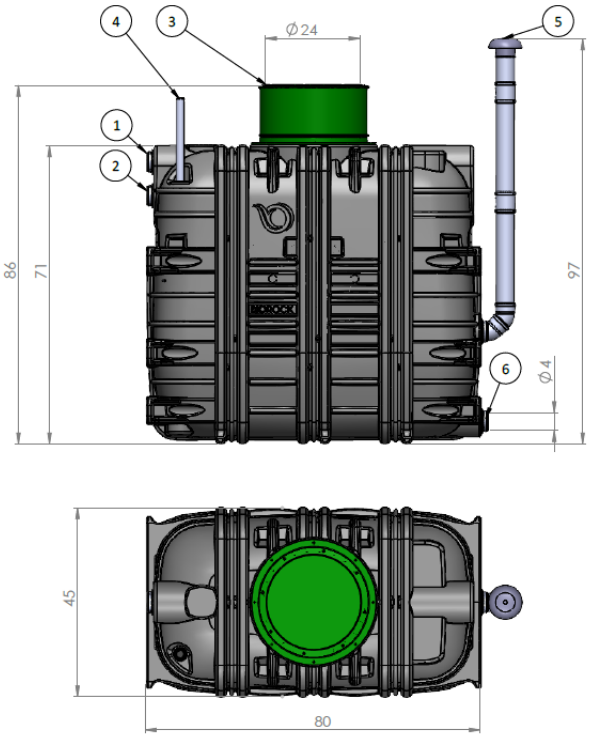
# ECOROCK 750
## Treatment Unit 660 gallons







| | |
|---|---|
| 1 | AIR OUTLET |
| 2 | WATER INLET |
| 3 | LIDS |
| 4 | ALARM |
| 5 | AIR INLET |
| 6 | WATER OUTLET |

| CARACTERISTICS | VALUE | UNIT |
|---|---|---|
| Capacity (daily volume per day) | 750 | Gallons/day |
| **SECONDARY TREATMENT** | | |
| Volume | 660 | Gallons |
| Media volume | 614 | Gallons |
| **SPECIFICATION** | **VALUE** | **UNIT** |
| Overall length | 80 | Inches |
| Treatment area | 2390 | Sq inches |
| Overall width | 45 | Inches |
| Overall height | 86 | Inches |
| Overall height + air inlet | 97 | Inches |
| Total weight | 810 | lb |
| Pipe diameter | 4" | Inches |
| Lid diameter | 24" | Inches |

| REVISION | DESCRIPTION | NOM / DATE | Création | BIOROCK |
|---|---|---|---|---|
| | | | NOM: TC | |
| | | | DATE: 02/12/2021 | TITRE: FT-00094 ECOROCK 750 Treatment Unit 660 gallons |
| | | | Vérification | |
| | | | NOM: TC | |
| | | | DATE: 02/12/2021 | |
| | | | Rev: 0 | Echelle: Scale: 1:20 Page: Sheet: 1/1 A3 |

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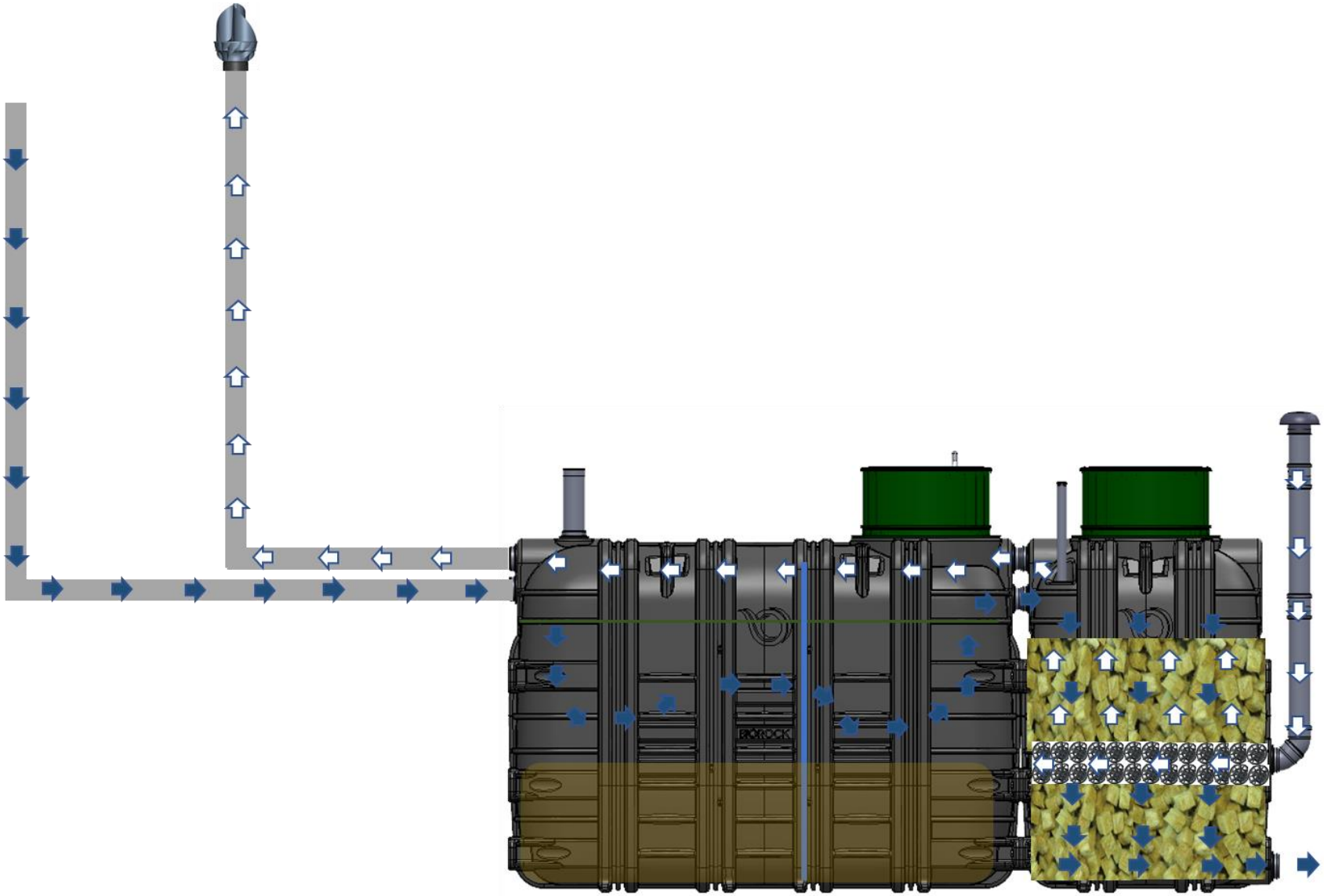
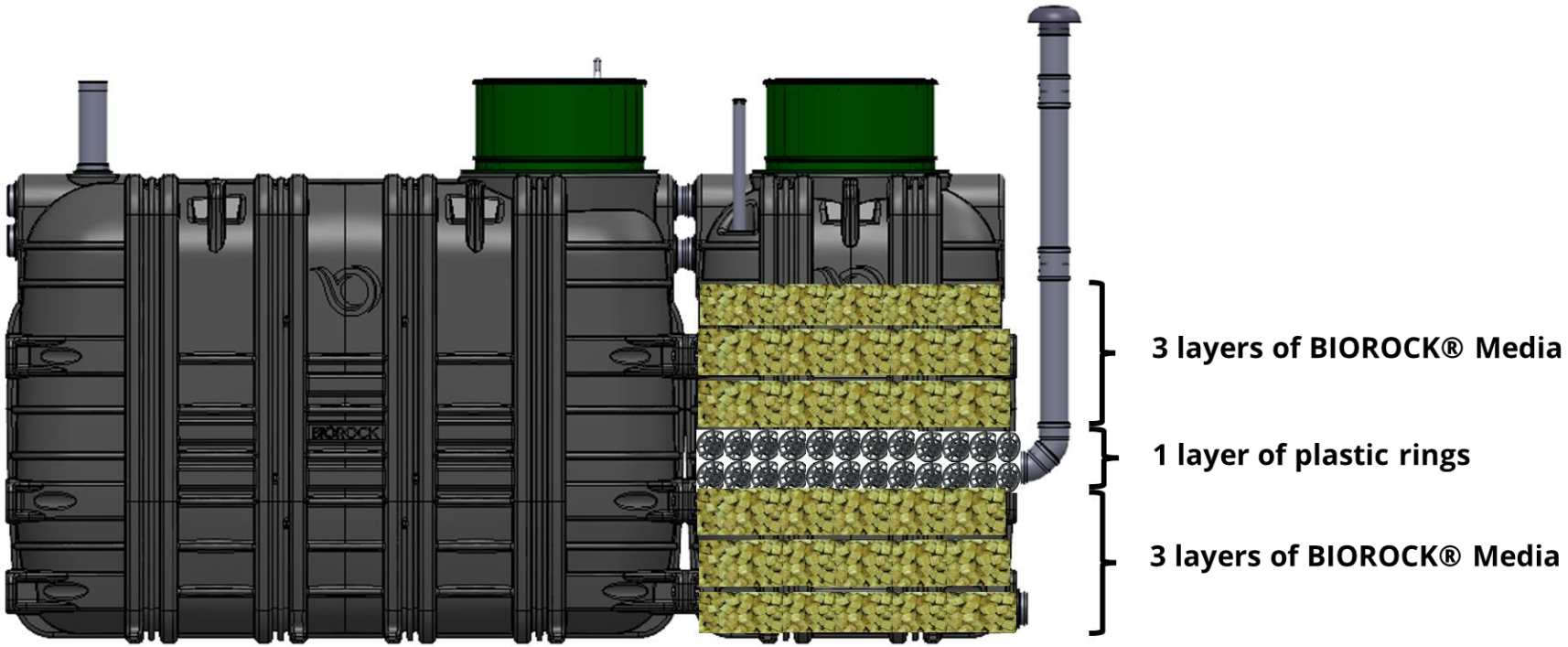
## APPENDIX 2 – AERATION & WATER DISTRIBUTION OF THE ECOROCK TREATMENT UNIT



## APPENDIX 3 – BIOROCK® MEDIA LAYER IN THE ECOROCK TREATMENT UNIT



# APPENDIX 4 - MAINTENANCE AND ACTIONS FORMS

*To be completed – TO BE KEPT BY THE USER*

DATE OF COMMISSIONING: ..... / ..... / .....
Serial Product Number of tank: (see page 7)

**Warning:**
Please keep sludge emptying documents and proofs validated by the contractor.

| DATE | WORK CARRIED OUT | CONTRACTOR NAME | COMMENTS |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
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# APPENDIX 5 – ACTIVATION OF THE WARRANTY

*This form must be returned to BIOROCK Acuantia within 120 days from the date of the commissioning*

## INSTALLATION FORM FOR THE MONOBLOCK-M

**Please fill in and return a copy:**
By e-mail : sav@biorock.com

**Or fill in the form on our website :**
**biorock.sav.com**

***KEEP A COPY WITH YOUR MAINTENANCE GUIDE.***

**SERIAL NUMBER:** .....

**DATE OF INSTALLATION:** ...../...../.....

**DATE OF COMMISSIONING:** ...../...../.....

**DISTRIBUTOR:**
Name:
Address:

Tel:
Fax:
Email :

**INSTALLER:**
Last name:
First Name:
Company name:
Address:

Tel:
Fax:
Email :

**OWNER**
Last name:
First Name:
Address:

Tel:
Email :

***INSTALLATION ADRESS IF DIFFERENT FROM THE OWNER***
Last name:
First Name:
Address:

Tel:
Email :

**Specify :**

Type of housing: ..... Number of rooms : ..... Number of occupants: .....

Construction: □ New □ Existing

Terrain (sub-soil) : □ Dry □ Wet □ Difficult □ Sloping □ Under roadways

Discharge : □ Infiltration □ Drainage □ Surface discharge □ Other :

Ventilation: □ Natural □ Electrical

Riser: □ No □ Yes (maximum 1)

Pumping station: □ At the outlet of the system □ At the collecting tank from the building

**Declaration**:

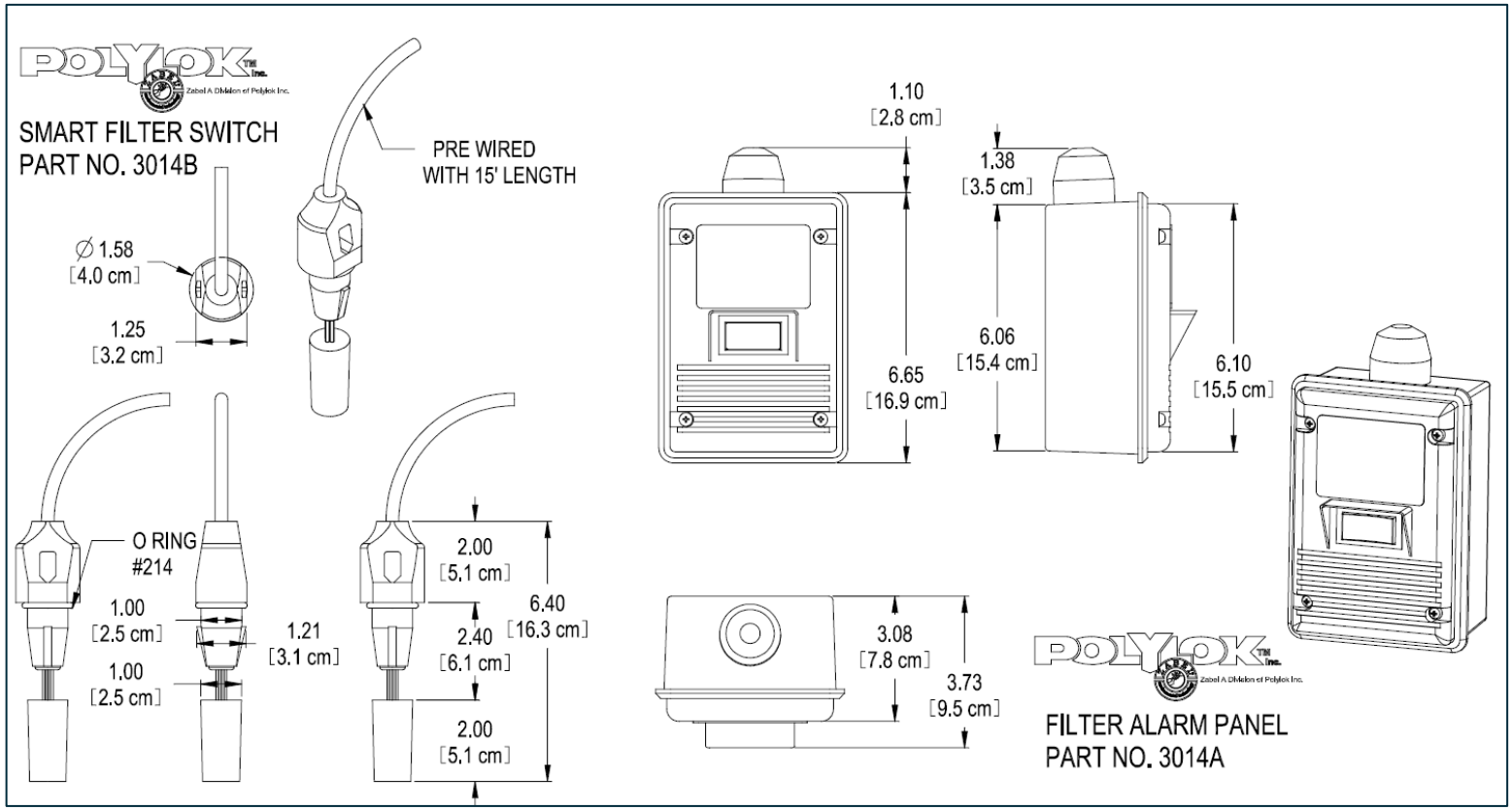
The MONOBLOCK-M system is installed and commissioned in accordance with:

- The current legislations stating the technical requirements applicable to domestic sewage treatment plants in the territory where the system has been installed
- The installation, usage and maintenance requirements indicated in the manual provided

Signed at: ..... on .....

| Owner: | Authority (if applicable) | Installer: |
|---|---|---|
| | | |

# APPENDIX 6 – ALARM TECHNICAL SHEET




**Alarm Panel:**

**Enclosure**: 6.5 x 4.5 x 3.0 inch (16.51 x 11.43 x 7.62cm), indoor/outdoor, weatherproof, thermoplastic. **Horn**: 82 decibels at 10 feet (3 meters)
**Electrical**: 120 VAC, 50/60Hz, 7 watts max. (alarm condition)

**Control switch**:

VRS control switch with magnetically activated reed switch. **Control differential**: 0.375 inches (1cm). **Cable**: 10 feet (3 meters), flexible 18 gauge, 2 conductors SJOW (UL, CSA), water-resistant (CPE). Housing and Float: 1.60 inch diameter x 6.7 inch long (4.06cm x 17.01 cm), high impact, corrosion resistant PVC for use in sewage and non-potable water up to 120°F (50°C). **Electrical**: 5 amps, 125 VAC/250 VAC, 50/60 Hz.

# ALARM INSTRUCTIONS INSTALLATION

**⚠WARNING** **ELECTRICAL SHOCK HAZARD**
Disconnect power before installing or servicing this product. A qualified service person must install and service this product according to applicable electrical and plumbing codes.

**⚠WARNING** **EXPLOSION OR FIRE HAZARD**
Do not use this product with flammable liquids. Do not install in hazardous locations as defined by National Electrical Code, ANSI/NFPA 70.

**Failure to follow these precautions could result in serious injury or death.**
**Keep these instructions with warranty after installation.**

- Install in accordance with National Electric Code, ANSI/NFPA 70 to prevent moisture from entering or accumulating within boxes, conduit bodies, fittings, float housing, or cable.

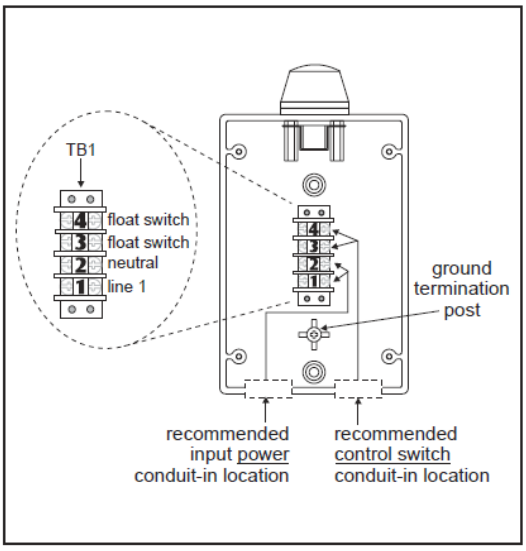
## INSTALL ALARM AND CONTROL SWITCH

1. Determine mounting location for alarm panel. Position so side instruction label is visible and readable.
2. Mount alarm box using existing holes in back of box. To ensure a watertight seal, use screws and sealing washers included with alarm.
3. Determine "conduit-in" locations on alarm (see Figure A).
4. Drill holes for conduit entry, taking care not to damage bosses inside alarm box.
5. Attach conduit. Use liquid-tight connectors if installing outdoors.
6. Bring control switch cable through conduit and attach to terminal block 1 (TB1) positions 3 and 4 (see Figure A). Leave adequate cable for filter removal. **Note:** Cable is not suitable for direct burial.
7. Attach input power conductors to TB1 positions 1 (line 1) and 2 (neutral), and ground wire to ground termination post (see Figure A).
8. Attach alarm box cover using the four pre-installed screws.
9. Turn on power.

## TEST SYSTEM

1. Check installation by moving control switch float upward. The system should indicate an alarm condition.
2. Push test/normal/silence switch to silence horn (beacon should remain illuminated).

**Figure A**




POLYLOK™ Inc.
3 Fairfield Blvd. Wallingford, CT 06492
Phone: (877) 765-9565 Fax: (203) 284-8514
sales@polylok.com www.polylok.com