

## QUOTATION

Date	Wednesday, November 11, 2020
Sales Rep	David Njuguna
Job Description	Koiyaki Guide School-Mara
Quotation No.	BWTL/DN/Q/01/0098
WWTP	SBR Compact 60PE
Valid Until	60 Days from Date Above

Thank you for your interest in Bioliff, the leaders in innovative on-site waste water treatment systems. We, herewith, provide our price and general specifications for the design, supply, delivery, installation and commissioning of an SBR Mini Decentralised Waste Water Treatment Plant with suitable capacity and organic loading in terms of your process design specifications. Our systems are proudly designed, manufactured, installed and supported from our Kenyan office.



## ABOUT THE SBR Mini WASTE WATER TREATMENT PLANT

**RECYCLE 100% of the Water You Have Already Paid For.** The SBR Mini Wastewater Treatment Plant produces clear, odourless and environmentally safe water ideal for the following uses:



Irrigation



Car Wash



Toilet Re-Flush



Washing Down



Discharge to Environment

\*\*For reuse of flushing, we recommend the installation of an economical filtration system. Please speak to your Bioliff Representative for more details.



**The Most Effective  
Water Recycling Solutions Available**

**IN PARTNERSHIP WITH**  
  
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# SBR Mini

WASTE WATER TREATMENT SYSTEMS

## HOW IT WORKS

The SBR Mini technology provides a simplified and economic method to treat your sewage and wastewater to a high standard. The best results are obtained by utilising an Aerobic Biological process whereby beneficial bacteria and microorganism consume the waste and oxygen.

The SBR tank and equipment can be considered as life support for the beneficial bacteria responsible for removing waste from the water. The treatment process involves 2-4 cycles which are repeated within a 24hr period. Each cycle involves 4 steps:



### Step 01 Filling

The sewage (both black & grey water) enters the SBR Reactor Tank. The SBR Mini is a continuous fill system, the level in the tank incrementally rising during a full treatment cycle.



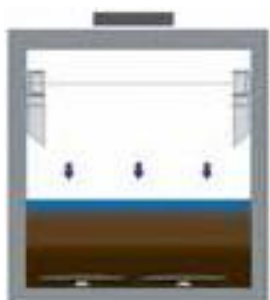
### Step 02 Aeration

Air is introduced into the SBR reactor tank, mixing the contents and providing oxygen to the beneficial bacteria responsible for consuming the waste. The bacteria are present in huge populations known as activated sludge.



### Step 03 Settling

The aeration is paused to allow the activated sludge to settle. The sludge settles to the bottom drawing all suspended solids with it. This leaves a layer of clear treated water on top.



### Step 04 Discharge

After settling the clear water is discharged from the SBR. The treated wastewater is clear, odourless, and fit for the environment. The water is also available for re-use such as irrigation, carwash, toilet flushing and so on.

## PROCESS EQUIPMENT SMART Controller



Controls plant equipment and process. Comes with user display, log events & alarms

## Air Pump



Pumps air into the SBR tank. Power efficient & quiet operation

## Fine Bubble Diffusers



Fine bubble aeration for efficient oxygen transfer into the water.

(SBR) technologies produce significantly less waste sludge. It is often forgotten, or not spoken about, that waste sludge is always a reality in wastewater treatment – no matter the technology/process employed. As such any reduction in sludge volume, or ease of management, is a welcomed bonus.

## PROCESS DESIGN

The data provided below was used to determine the STP best suited to the project. We request that any alternative proposals that are needed stay within this design criteria. If the data below is not correct, please let your Bioliff Representative know.

Unit	Heads / Cycle	Flow	Total flow	BOD/pe (g)	Total BOD	SS/pe (g)	Total SS	Ammonia (g)/pe	Total Ammonia	PE
Students - Boarding	40	175	7,000	60	2,400	80	3,200	8	320	62
Students - Day (with canteen)	0	90	0	38	0	20	0	5	0	
Teaching Staff - Boarding (incl Families)	2	150	300	60	120	20	40	8	16	
Teaching Staff - non resident	18	90	1,620	38	684	20	360	5	90	
Staff (admin, office, grounds keeper, etc) - resident	14	90	1,260	38	532	20	280	5	70	
Staff (admin, office, grounds keeper, etc) - non resident	0	90	0	38	0	20	0	5	0	
			<b>10,180</b>		<b>3,736</b>		<b>3,880</b>		<b>496</b>	

### Primary Tank Influent Load

Hydraulic Load	10,180 ℓ
BOD Concentration	367 mg/ℓ
COD Concentration (at 1.8)	661 mg/ℓ
Suspended Solids	381 mg/ℓ
Ammonia as N concentration	49 mg/ℓ

### STP Influent Load

Hydraulic Load	10,180 ℓ
BOD Concentration	294 mg/ℓ
COD Concentration (at 1.8)	528 mg/ℓ
Suspended Solids	30 mg/ℓ
Ammonia as N concentration	49 mg/ℓ

## COSTS

### DESIGN, SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING

ITEM DESCRIPTION	QTY	UNIT PRICE	NET PRICE
Design and Supply of 60PE SBR Compact Wastewater Treatment Plant	1	1,200,000	1,200,000
Design and Supply of Underground Storage Tank inclusive of a discharge pump	1	165,000	165,000
Design and Supply of a Grease Trap (1200 x 400 x 400mm)	1	150,000	150,000
Delivery, Installation and Commissioning (Mara)	1	100,000	100,000
<b>SUBTOTAL</b>			<b>1,615,000</b>
TAX- VAT 14%			226,100
<b>TOTAL</b>			<b>1,841,100</b>

## Optional Paneltim PP Plant Structure

The tank structure is fabricated with Paneltim polypropylene (PP) sandwich panels that are **lighter** and **stronger** than other plastic construction panels, they are **resistant** to chemicals & corrosion and they can be welded very easily. **This makes them highly suitable for constructions that are required to be light, strong, clean & anti-corrosive.**



## Convenient Plug & Play Solution



**Step 1 – Tank Fabrication**



**Step 2 – Delivery to Site**



**Step 3 – Installation**



**Step 4 – Completion, pending final landscaping**

## OPERATIONS AND MAINTENANCE



The operational costs are very low that the only moving parts are the pumps and blowers- regulated by the control panel, are programed to operate on different modes and timers allowing for significant power reduction.



Once installed the system will take some time to establish a good level of biomass. Depending on different factors, this may take anytime from 2 – 8 weeks. Please discuss further with a Bioliff Representative.



Operator Training and Maintenance will be provided free of charge upon completion of the installation. We require that the operator follows the Operation and Maintenance procedures provided.

## MAINTENANCE AGREEMENT

During the first year of operation, maintenance will be provided FREE OF CHARGE. Following the second year of operation, Bioliff strongly recommends signing up for a Maintenance agreement.

## LOCAL AUTHORITY AND NEMA REQUIREMENTS

Bioliff undertakes to ensure that effluent quality will meet the required local authority specifications (NEMA and National Water Act: General Limits) within 8 weeks of the release of a job completion certificate and will maintain these values within the inclusive maintenance periods. We are unable to ensure compliance with the required specification if the plant is managed by an operator other than trained by ourselves and/or if the maintenance procedures (to be detailed) have not been adhered to.

As the treatment system is based on biological processes and principles, the plant is unable to reduce heavy metals already present in the influent waste water stream. Furthermore, the sewerage treatment plant cannot reduce Ortho-Phosphates biologically. Should the O-PO<sub>4</sub> be excessive and beyond limits, a modification can be made to treat this either biologically or chemically at an additional cost. The same applies if the upstream reticulation is contaminated with non-organic or non-biodegradable substances.

For proof of registration with NEMA, please see your Bioliff Representative for further details.

### ANTICIPATED FINAL EFFLUENT QUALITY

pH	6.5 – 8.5
BOD	<30 mg/ℓ
COD	<50 mg/ℓ
Suspended Solids	<30 mg/ℓ
NH <sub>4</sub> -N	<5 mg/ℓ
Faecal Coli-Forms	nil/100 mℓ

## WARRANTY INFORMATION



Mechanical Equipment  
2 Year Warranty from Date of Purchase



Pipework, Fittings, Electrical Work & Labour  
1 Year Warranty

## TERMS AND CONDITIONS

### PAYMENT TERMS

**70%** of the Contract Value is due upon Order Placement.  
**20%** of the Contract Value is due upon Readiness of Plant to Leave Bioliff Factory.  
**10%** of the Contract Value is due upon Practical Completion or 30 days from Install; which ever comes first.

Should the client/contract specify a performance bond or retention withholding amount, this must be confirmed before order placement.

### DELIVERY TERMS

Delivery on-site will be 4-6 weeks from:

1. Receipt of Signed Order Acceptance
2. Contract Documentation where applicable.
3. Payment(s) as per payment agreement.
4. Completion of all site preparations including but not limited to civil works and electricity.

## GENERAL NOTES

1. WWTP are designed on the basis of receiving typical effluent from a domestic effluent development.
2. The system parameters exclude inorganic matter. The effective operation of on-site sewerage treatment plants require that the design and maintenance of the upstream reticulation is in order, particularly the screens and grease traps.
3. Effective waste water treatment systems require regular inspection and pro-active maintenance. Information to aid the operator will be presented once the installation has been completed. Failure to regularly inspect the system and report a malfunction will void the warranty.
4. Mechanical and electrical parts are limited to the manufacturer's warranty policies except where stated otherwise in writing by ourselves.
5. Any standing time due to external delays and/or factors that influence the ability for Bioliff to conclude their on-site activities will be charged to the client's account at 5,000 kshs per day. This includes but is not limited to lack of power, water, access, casual labour, offloading ability.

## EXCLUSIONS

The following are excluded from this quotation unless specified otherwise.

1. Civil works. Including but not limited to concrete work, earth works, excavation, backfilling and compaction;
2. Buffer/Collection/Conservancy Tanks- installation and maintenance of these;
3. Grease interceptor traps- maintenance of these- all commercial kitchens are to be fitted with an adequate grease trap prior to installation and commissioning of WWTP;
4. Pipework and Electricity Supply to and from the treatment system;



5. Fixtures of fittings to conceal the system(s);
6. Systems for further and/or future use of the treated effluent;
7. Packaged Plant Maintenance Agreement(s);
8. Water and electricity utilized during installation, commissioning, operation and maintenance of said treatment plant;
9. All Certifications and Permits required by Council Authorities, NEMA or any other governing board;
10. Any water testing analysis.

**E&OE** Bioliff endeavors to continually improve our systems and may change the design or specifications without notice at any given time.

