



February 2015
Domestic Wastewater Treatment Plant Biopipe for STFA Labor Camp in Oman.

A CASE STUDY OF BIOPIPE

Introduction

STFA Investment Holding Group is one of Turkey's long established company providing construction (STFA Construction), energy (ENERYA) and construction equipment (SIF-JCB) sectors.

Sezai Turkes and Feyzi Akkaya founded STFA in 1938; it became the pioneer company in bridge constructions in a short period of time with dramatic growth.

In the successful years that followed, STFA has transformed into an integrated company that have solved problems with high standard engineering quality. Marine works, engineering and infrastructure works, water and wastewater transmission lines, oil & gas, energy projects are just some of STFA's projects that they developed and commissioned.

Besides STFA strong presence and its constructed, complete or on-going bridges, road, transmission lines, power plants projects in Turkey, STFA has also a strong appearance with an active role in the Middle East and North Africa projects in last decades.

STFA assigned with Biopipe a domestic wastewater recycling and reuse in a site for a daily irrigation usage without sludge production in a short amortize period.

Key Data

Project: HotelKhasab to
Tibat Coastal Road -
Oman

Plant Type: Treatment of
domestic wastewater in
labor camp.

Project Capacity:
120m³/day – 600
person/day

Use: Recycle wastewater
to reuse in agriculture by
under < 20 BOD/day mg/l
water.

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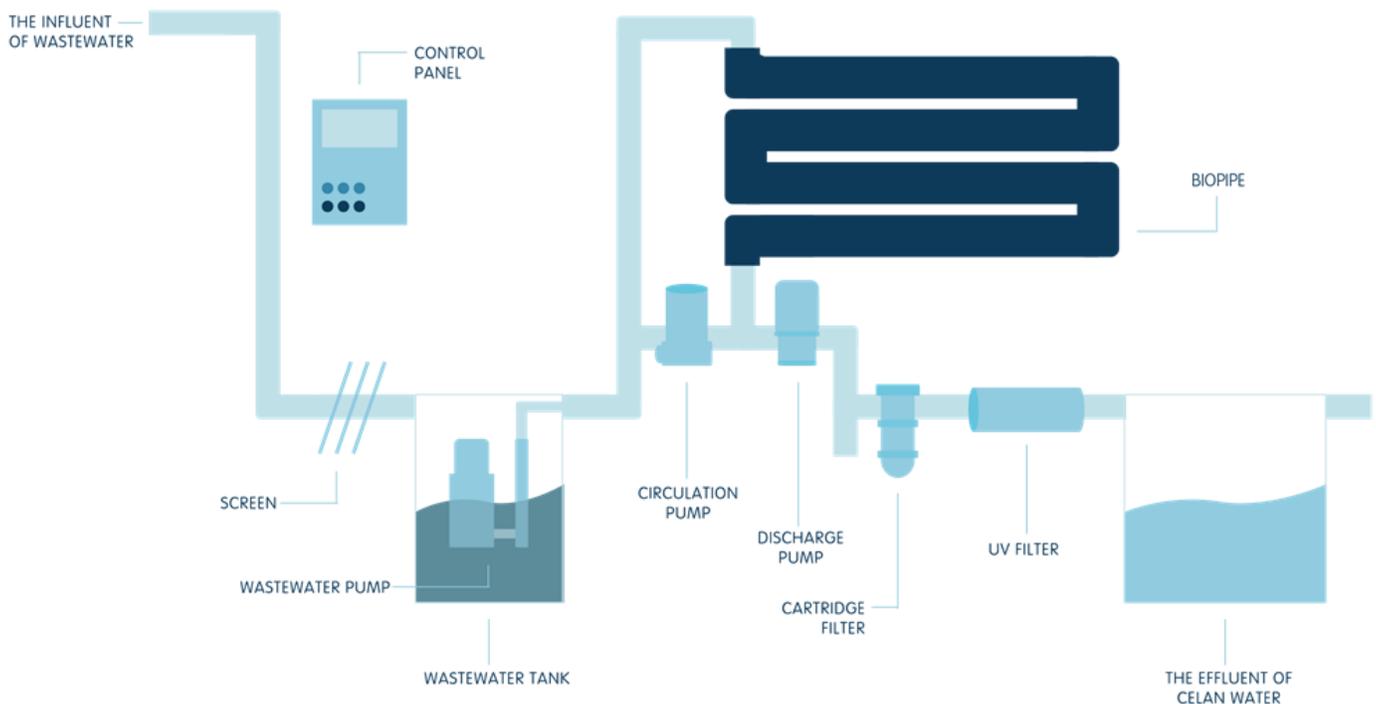
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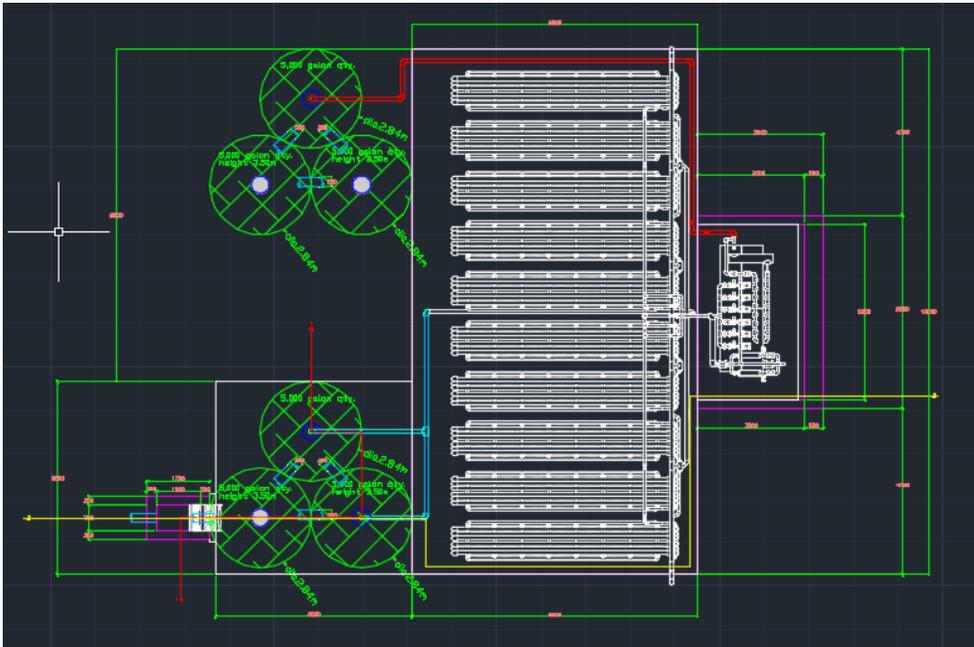
BIOPIPE

Biopipe is the first biological wastewater treatment where the process takes place entirely inside the pipe. With a simple design and effectual treatment, Biopipe works as on the below;

1. An equalization water tank is used to store domestic wastewater with inorganic and organic substances. Depends on system capacity screen and sand separator are used before equalization tank.
2. Wastewater reaches the operational level in the tank, the wastewater pump pumps water to circulation pump.
3. When Biopipe becomes full, circulation starts and treatment begins. Biopipe bacteria engages with pollutants and eliminates them from wastewater during circulation while 'air is automatically vacuumed by the pressure difference in order to allow aerobic bacteria to further treat the wastewater.
4. Wastewater then passes through a disc filter (cartridge filter) and an UV filter to complete treatment. The treated water can be used directly or stored in a clean water tank.

Biopipe is remote controlling, flexible – modular design, eco–friendly and sustainable treatment system. A large scale of usage capacity, starts with 1 m³ / day to municipalities.





System Area:

120m²

System Dimensions:

20m x 6m x 2,5m

Wastewater Tank
(needed):

80m³

Clean Water Tank
(needed):

80m³



ENVIRONMENTAL BENEFITS

Thanks to Biopipe bacteria, all organic particles inside domestic wastewater are consumed during circulation period of treatment. Circulation period occurs after wastewater pump reaches to water to circulation pump. At the end of 2 – 4 hours treatment stage, only clean water is produced. The main benefit is to not have to do waste management, consume more energy and more man – power. Therefore, customer does not have to solve noise pollution and odor, which Biopipe does not produce. The aeration of Biopipe is provided with venturi system instead of blower. This is induced that comparing with other market treatment plants, Biopipe operating cost is much more less.

In addition, Biopipe is classified to be an innovative wastewater treatment technology that makes the end user achieve the requirement to get LEED accreditation related to water efficiency and water re-use applications.

In this project's region, there is an infrastructure but want to LEED certificate. Recycling of black water is caused to get much more points than grey water treatment from LEED.

Biopipe flexible design option, system is installed in parking garage and total area is consisted only two cars.



Scope of work

Briefly, Biopipe is the domestic wastewater treatment system that recycles wastewater into a water appropriate with a biological method (biofilm) in a U-PVC pipes.

Difference of Biopipe is made this without sludge production, low operating and maintenance cost.

With modularity option of Biopipe, system can be divided and installed different camps.

Biopipe is installed in Khasab – Tibat Coastal Road – Labor Camp Project. Biopipe Capacity is 120m³/day.

The scope of work included complete design, engineering service, supply, installation, and commissioning and finalize with performance test.

- Physical Treatment with basket screen
- Biological Treatment on Biopipe support with circulation and discharge pump.
- Discharge of Water under EU standards after pass through disc and UV filter.
- Biopipe Effluent Water Quality is;
 - BOD: < 20 mg / lt
 - COD: < 30 mg / lt
 - TSS: < 10 mg / lt
 - pH: 6 – 9

With Biopipe, 43800 tonnes of water can be saved and used for irrigation on 20000 m². Result of this, Biopipe amortizes itself in 7 months.

BIOPIPE TREATMENT STAGES

Physical Treatment

In this system, screen option is presented but wastewater is accessed to system on a very high point and catches large inorganic particles.

Biological Treatment

As it can be seen on the flow chart, the wastewater pump reaches water to circulation pump under controlling by Control Panel. With the circulation pump, Biopipe bacteria engage with the wastewater and consume organics. This project needs to be under < 20 mg / lt BOD effluent water, accordingly the circulation period is determined.

Final Stage

Treated water is discharged by discharge pump. After the pump, any inactive bacteria have detached from biofilm layer are captured by a 100 micron cartridge filter and by going through UV filter. As a results, water standards are seized.