LG Sonic: wastewater treatment

Wastewater is any water that has suffered in quality by human intervention. Often, wastewater is being treated for re-use as drinking water or for other purposes. As high levels of nutrition are available in these waters, algae may grow rapidly as well as other micro-organisms such as bacteria. Algae can compete for nutrients against the bacteria in charge of sludge reduction and can also clog complete systems. LG Sonic uses the newest ultrasound techniques to remove algae from wastewater treatment plants and reclaimed water reservoirs.

How does the LG Sonic technology work in wastewater?

The LG Sonic systems can be applied in several tanks from the wastewater system. The units are, for example being placed in DAF (dissolved air floatation) tanks, flocculation tanks, clarifiers and sedimentation ponds. In all tanks the units have their benefits.

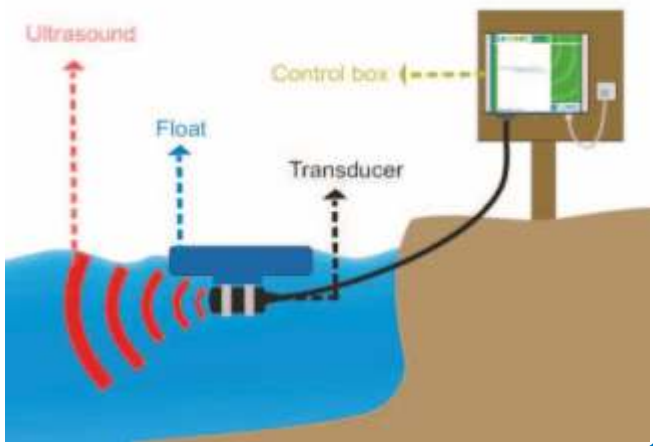
Maintenance of the LG Sonic device only involves cleaning the transducer head once every 1 or 2 weeks.

Once in operation (in either one of these tanks) the LG Sonic units send out ultrasound of various, very specific frequencies. All these frequencies have been determined by years of research and have proven to be the most effective to control filamentous and floating green algae but also blue-green algae. The different frequencies of the LG Sonic cause certain sound pressures and oscillation of the algal cells, through which some compartments within the algal cells will rupture, for example the cell's vacuole and/or gas vesicles. Furthermore the sound frequencies of the LG Sonic suppress the growth of algae.

In addition, levels of physico-chemical components will be reduced by the LG Sonic solution. Examples are nitrates, phosphates, sulphates, ammonium, 5-days biological oxygen demand (BOD5), chemical oxygen demand (COD), total suspended solids (TSS) and pH-levels. These reductions seem to be a mixture of direct and indirect effects of the LG Sonic treatment.
By inhibiting the algae in their growth, they no longer consume the nutrients that the aerobic and anaerobic bacteria need. Furthermore, the ultrasound emitted by the LG Sonic causes a vibration that can help bacteria with their food finding efforts and speed up the nutrition process. Both phenomena have a positive effect on the growth and population of bacteria, which will speed up the reduction of sludge.

LG Sonic in DAF and Flocculation tanks:

TSS, especially in the DAF and flocculation tank, is of great importance to have a good reaction/interaction between bacteria (aerobic decomposition), chemicals and the waste to be degraded. Thus, the more solids in suspension, the more exposed interacting surface, the more efficient the reaction kinetics will be. In addition the ultrasound emitted by the LG Sonic, reduces large aggregates of solid components and induces declumbing of bacterial aggregates, thus a higher interaction between both solids and bacteria is established.



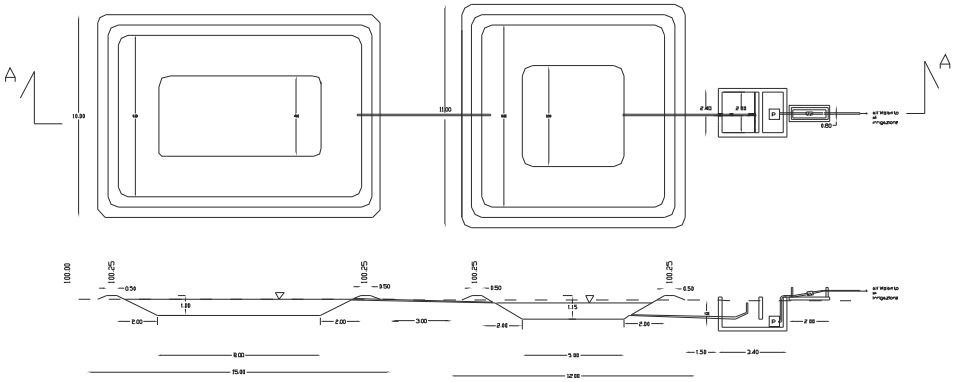
FIELD APPLICATION FOR CROP IRRIGATION USING SECUNDAIRY TREATED WASTE WATER

University of Catania
Department of Agriculture Engineering

Device used : LG Sonic® XXL

1° LAYOUT PILOT PLANT - LINE a

US LG Sonic → Filter → UV



1° LAYOUT PILOT PLANT - LINE a

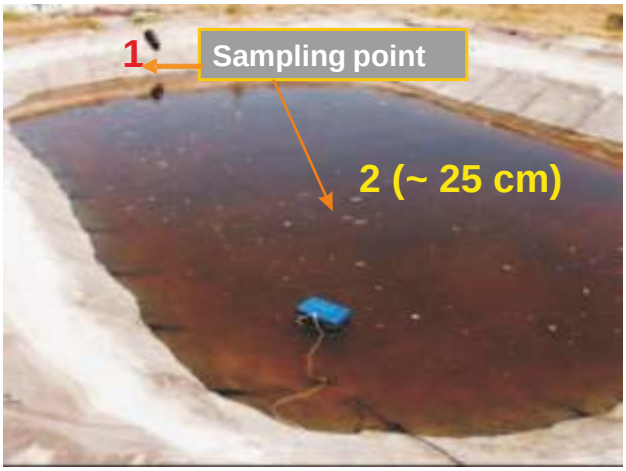
Area = 32 m^2
$Q_{designed}$ = 1 L/s
Volume = 61.14 m^3
t (retention time) = 17 hours

Area = 81 m^2
$Q_{designed}$ = 1 L/s
Volume = 40.26 m^3
t (retention time) = 11 hours

FIELD APPLICATION FOR CROP IRRIGATION USING
SECUNDAIRY TREATED WASTE WATER

BATCH SYSTEM: US UNIT - LINE a

1. Emptied pond with bottom and liner cleaned before installation of the LG Sonic.
2. Refilled with wastewater
3. Installed LG Sonic XXL (18th July)

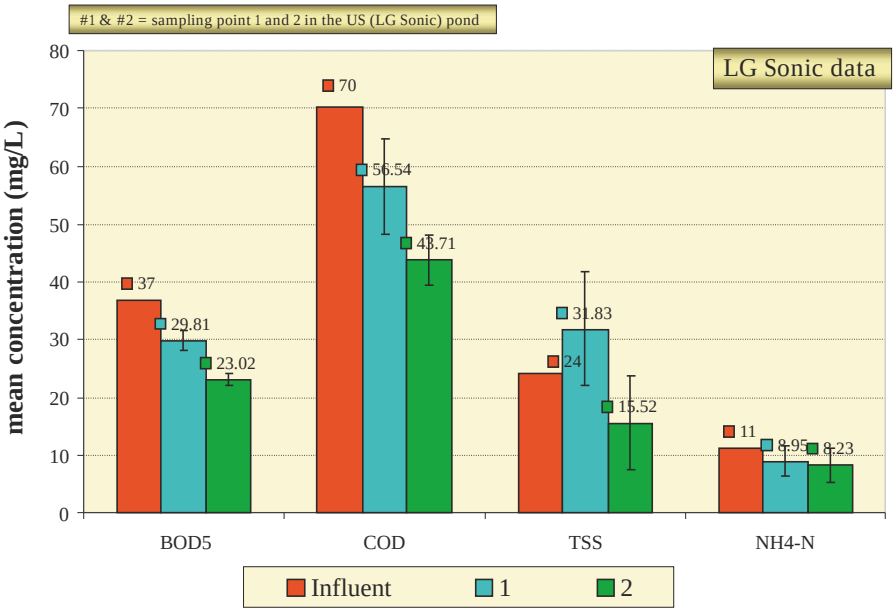


BATCH SYSTEM: LG Sonic UNIT - LINE a

30th July

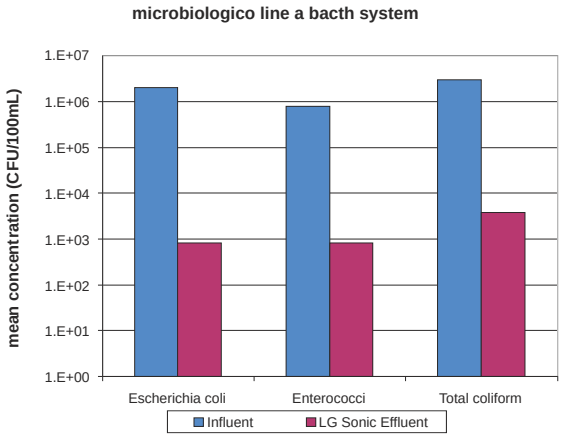
06th August

Parameters	Units	18/07/2007	06/08/2007		11/09/2007		17/09/2007		24/09/2007	
		Influet	#1	#2	#1	#2	#1	#2	#1	#2
pH		7.40	9.20	7.63	8.96	7.94	8.84	6.90	7.88	7.02
BOD_5	(mg/L)	36.82	**nd**	**nd**	29.07	23.63	27.48	21.77	30.15	23.65
COD	(mg/L)	70.20	42.18	37.60	57.57	47.11	54.40	43.52	59.90	46.60
TSS	(mg/L)	24.16	37.00	6.33	26.00	24.67	42.00	19.33	16.00	11.76
SS	(mg/L)	0.38	**nd**	0.20	**nd**	0.40	**nd**	0.20	**nd**	0.10
NH_4-N	(mg/L)	11.15	8.76	7.37	7.84	7.05	13.30	12.56	6.71	5.95
NO_2-N	(mg/L)	0.52	0.11	0.01	0.19	0.10	0.33	0.29	0.35	0.24
NO_3-N	(mg/L)	7.98	6.10	5.65	3.24	3.12	5.94	3.07	6.86	5.05
N_{org}	(mg/L)	3.11	3.60	2.63	2.60	2.54	1.13	1.10	1.23	0.99
TN	(mg/L)	22.76	18.57	15.66	13.87	12.81	20.70	17.02	15.15	12.23
PO_4-P	(mg/L)	3.43	0.65	0.63	2.92	2.87	3.95	3.87	3.55	3.39
TP	(mg/L)	3.83	1.21	3.51	3.41	3.38	4.19	4.00	3.91	3.71
Chlorophyll-a	(mg/m^3)	0	97.35	12.17	66.95	17.03	73.10	9.77	0.00	0.00



Parameters	Units	Influent 18/07/07	US Effluent
Escherichia coli	CFU/100mL	2.E+06	8.E+02
Enterococci	CFU/100mL	8.E+05	820
Total coliform	CFU/100mL	3.E+06	3800

Note: Scale at the right is given logarithmica.



"The installation involved placing a rigid conduit on the inside sidewall of the clarifier and the LG Sonic mounted to the rear of the skimmer though underneath the path of the rotating arm. The rotating skimmer easily passes over the conduit due to a rubber scraper at the end of the skimmer arm.

The 3 clarifiers had to be cleaned each week which took 4-5 hours total, currently all three clarifiers are cleaned once a month, thus a reduction of 12 to 15 hours labor. A visual notation was made that noted the improved clarity of the water inside the clarifier. The city also noticed a slight reduction in their chlorine demand before the discharge to the creek"

ADVANTAGES

- ✓ Reduces and controls algae in the water in an efficient, cost-effective manner.
- ✓ Prevents further algal growth
- ✓ Stimulates bacteria in clearing the water of unwanted components
- ✓ Reduces physico-chemical components
- ✓ Reduces biological components
- ✓ Improves the reduction of sludge
- ✓ Low maintenance
- ✓ Does not harm the environment
- ✓ Low energy consumption
- ✓ Establishes higher interaction surface between both solids and bacteria

LpBs — Low Power – Bright Signal technology with a lower power consumption and a stronger signal

Low energy consumption of max. 16 Watts

DC-MF — Dual core multi frequency technology

can be mounted to a solar panel

Aluminium box for a better protection against influences of the weather

3 YEARS Guarantee — Three years Guarantee

LG SOUND
Innovation based on knowledge

www.lgsonic.com

7 reasons to choose for LG Sound:

- ☑ An environmentally friendly solution for algal and biofilm problems.
- ☑ Up to date, scientific feedback of trained biologists.
- ☑ High quality products designed to the needs of our clients.
- ☑ User-friendly devices which are easy to install.
- ☑ Excellent service before and after sales.
- ☑ Direct contact with biologists from LG Sound.
- ☑ Solar system available