



Viability of waste water treatment with a SBR system in an industry of municipal solid waste treatment

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Introduction:

The leachate treatment is more difficult than conventional wastewater treatment. One of the leachate problems is the low biodegradable organic matter concentration, and low alkalinity to complete nitrogen removal.

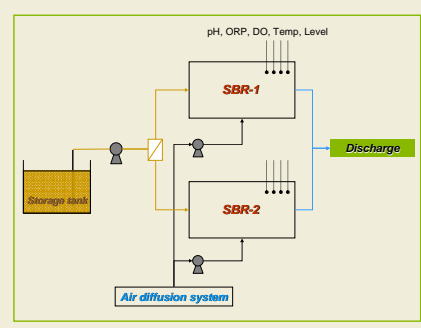
For this reason, the leachate treatment needs the external bicarbonate and organic matter addition. Other aspects to control the efficiency process are the control of inhibition problems with free ammonium and nitrous acid.

The objectives of the collaboration between ECOPARC de Barcelona and LEQUIA-UdG were the stabilization of wastewater treatment plant to 80m³/day and increase the capability to the designed volume accomplishing the legislation.

WWTP at ECOPARC:

Figure 1 and 2 show the industrial SBR used to leachate treatment with 900m³ as total volume reactor.

Industrial SBR of Barcelona ECOPARC to leachate treatment



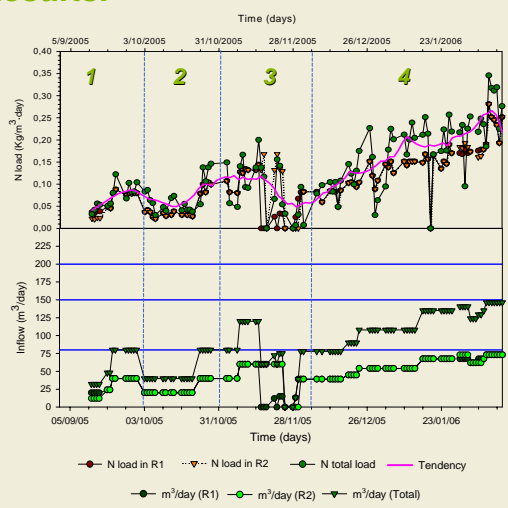
WWTP scheme of Barcelona ECOPARC

Mean leachate composition

	Average	Max	Min	SD	Number of samples	Units
COD	9605,4	16250,0	3008,0	2739,2	105	mg O ₂ /L
BOD ₅	3918,2	6768,0	820	1737,9	22	mg O ₂ /L
N-NH ₄ ⁺	2847,3	5500,0	1350,0	717,7	111	mg N-NH ₄ ⁺ /L
TKN	2872,0	4685,0	2054,0	735,2	23	mg N-TKN/L
P _{total}	14,1	21,0	8,9	4,6	20	mg P/L
Conductivity	24638,4	31100,0	14680,0	4258,8	98	mS/cm
Alkalinity	10405,9	12600,0	8300,0	2689,7	59	mg CaCO ₃ /L
SST	2381,9	8240,0	430,0	1797,6	59	mg/L
pH	8,0	8,5	7,4	0,8	98	

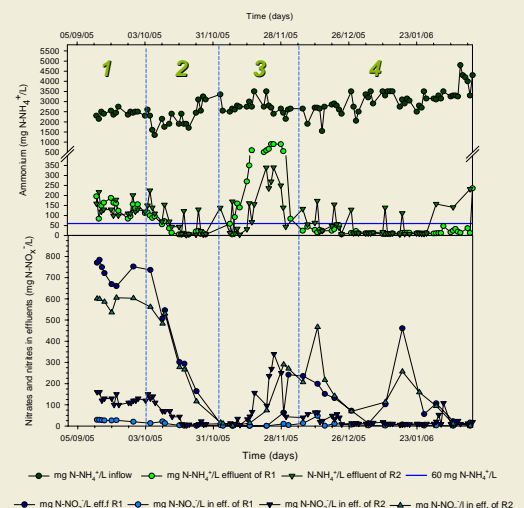
Raw leachate composition during the experimental period (September 2005 to February 2006).

Results:



- Process periods:
- 1.- Start-up of the SBRs
 - 2.- Nitrification at 80 m³/L
 - 3.- Organic matter and IC limitation
 - 4.- Process optimization

Ammonium, nitrate and nitrite concentration effluents in both reactors.



Volume treated and nitrogen load evolution since September 2005 to February 2006.

Conclusions:

The viability of the biological process to treat the wastewater of Barcelona ECOPARC is possible but difficult and expensive. The complexity is located in the high concentrations of ammonium; negatives stoichiometric proportions between ammonium, biodegradable organic matter and alkalinity.