

Artificial Wetland Case in Canary Islands

Los Carrizales at Tenerife's Island,
designed by J.L. Peraza (**2002**)

Canary Islands



- Archipelago located to the northwest Africa, belonging to the Spanish State.

Tenerife



- **Location of Los Carrizales** ($28^{\circ} 19' 06,28''$ N, $16^{\circ} 51' 25,85''$ O)

Los Carrizales



Protected Natural Space, about 593 m over the sea level.

Characteristics of the population.

- 25 registered inhabitants, but in the weekends and holidays there are possible residents, which is sometimes exceeding 200 (possible is to say that not continuously live there, although by having house devote several days a week to work their gardens and they are left to sleep), has several houses of rural tourism that are usually full.

Depuration System: Introduction.

This facility began to work on May 2002, beside this it was inaugurated by Wladimiro Rodríguez Brito, environmental counsellor from the Tenerife's island government on November 2002, as it was published by the local newspaper (www.eldiariodeavisos.com) on 28th November 2002.

Depuration System: Features.

- The total area occupied by the septic tank and the wetland does not exceed the 170 m². It is calculated for 150 PE and debugging all organic wastes from the homes, including food, scraps and oils.
- It doesn't generate smell, mosquitoes and is usable in its totality.

Surfaces and volumes of design.

- Wetland of some 90m² of surface with diverse species: *Phragmites australis*, *aethiopica*, *zantedeschia*, *penicetum purpureo*, *cana indica* or *cyperus alternifolius*, among others.
- Septic tank of approximately 200m³ of volume and 80 m² of surface.

Analytical effluent annual series.

Monthly control during the year 2009

MUESTRA: Salida de la Depuradora del Carrizal

FECHA:

<i>Parámetro</i>	29-ene	24-feb	29-mar	29-abr	25-may	26-jun	28-jul	31-ago	29-sep	30-oct	27-nov	23-dic
pH	7,1	7,2	7,5	7,0	7,7	7,4	7,5	7,2	7,3	7,7	7,7	7,4
Cond. 25°C (µS/cm)	1522	1141	1126	848	1472	1338	894	765	752	1028	1199	1256
Sólidos en suspensión (mg/l)	15	31	7	10	14	13	3	<2,5	6	5	6	7
DQO (mg O ₂ /l)	26	121	45	40	60	40	52	22	45	28	29	34
DBO ₅ (mg O ₂ /l)	2	51	4	3	6	7	5	4	4	9	7	6
NO ₃ ⁻ (mg/l)	2,2	<0,2	1,4	0,6	2,6	0,7	0,8	0,5	0,5	0,4	0,7	11,0

Performance of the sewage system.

MUESTRA: Entrada de la Depuradora del Carrizal

Parámetro	Resultado
pH	6'68
Cond. 25°C (µS/cm)	1.288
Sólidos en suspensión (mg/l)	2.020
DQO (mg O ₂ /l)	1.500
DBO ₅ (mg O ₂ /l)	920
NO ₃ ⁻ (mg/l)	11.8

FECHA:

24 de febrero de 2011

25 de mayo de 2011

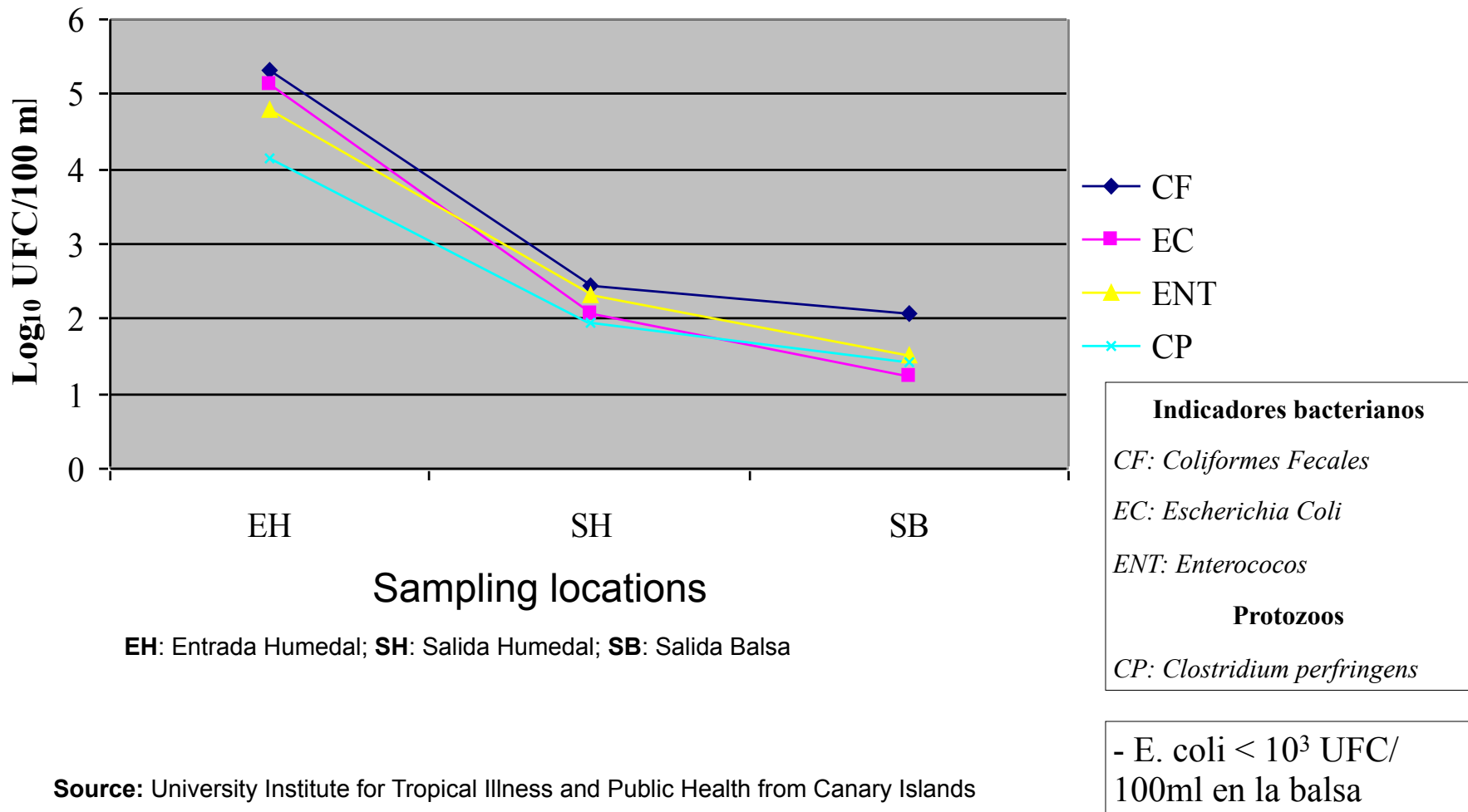
23 de agosto de 2011

Parámetro	Resultado	Resultado	Resultado
pH	7,4	7,3	7,3
Cond. 25°C (µS/cm)	916	984	883
Sólidos en suspensión (mg/l)	<2,5	2	23
DQO (mg O ₂ /l)	28	29	31
DBO ₅ (mg O ₂ /l)	5	5	4
NO ₃ ⁻ (mg/l)	0,7	0,7	1,0

Parameter	Input	Average output 2011	Yield
pH	6,68	7,3	
Cond. 25°C (µS/cm)	1.288	927	28,03%
Sólidos en suspensión (mg/l)	2.020	9,16	99,55%
DQO (mg O ₂ /l)	1.500	29	98,07%
DBO ₅ (mg O ₂ /l)	920	5	99,46%
NO ₃ ⁻ (mg/l)	11,8	0,8	93,22%

Microbiological parameters

Microbiological parameters reduction in Los Carrizales





Perspective of the artificial wetland in the environment, with store of treated water at the end.

Septic tank



- Details of the septic tank.

Access



- Access paths to the septic tank and the wetland.

Artificial wetland in its environmental context.



Effluent from the wetland.



Maintenance:

- Gardening: this is optional, every four months.
- Hydraulic Operation: review of pipes (access to septic tank); every three months.
- Analytical of the effluent: sampling according regulations in force, monthly.

Environmental Balance of the artificial wetland.

- Energy Consumption zero.
- Carbon Sink.
- Null negative externality.
- Increase resilience.
- Increase in biodiversity: bird sanctuary, niche for biocenosis from this biotope.
- Increase in the quality of the water and store water for diverse use in the territory.
- Integration into the environment.