



TECHNICAL VALIDATION OF THE COMPACT SYSTEM OF WASTE WATER TREATMENT MODEL FACET STP

Marcelino Otero López, Inma Rial Sánchez, Rafael Dopazo Santos, Gonzalo Alfonsín Soliño



INTRODUCTION

The aim of this study has consisted in the accomplishment of an technological development experimental project of follow-up and control of the functioning conditions of the waste water treatment plants FACET STP series. The information obtained in the follow-up was realized in the Center of New Technologies of Water (CENTA) along twelve months of functioning.



FACET STP TREATMENT PLANT

STP UNIT

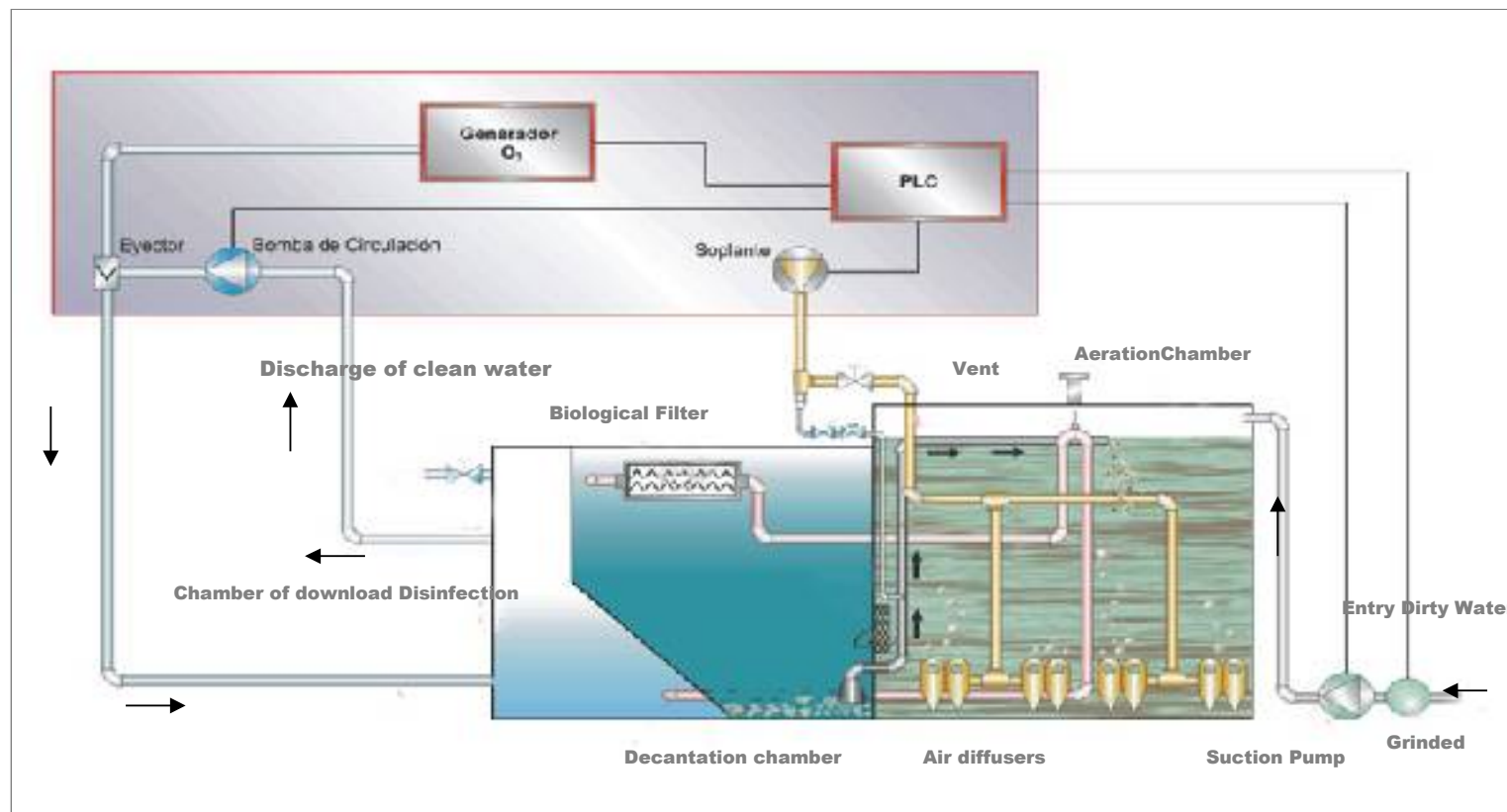
Package plant that performs a biological treatment with extended aeration, decantation and returning activated sludge ending with an ozone disinfection process.



THE PLANT

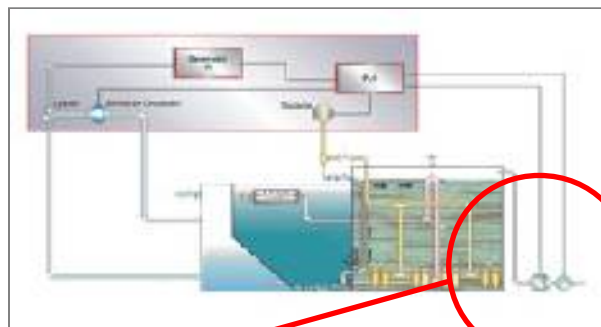


OPERATING GRAPH



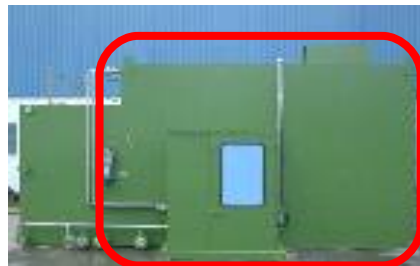
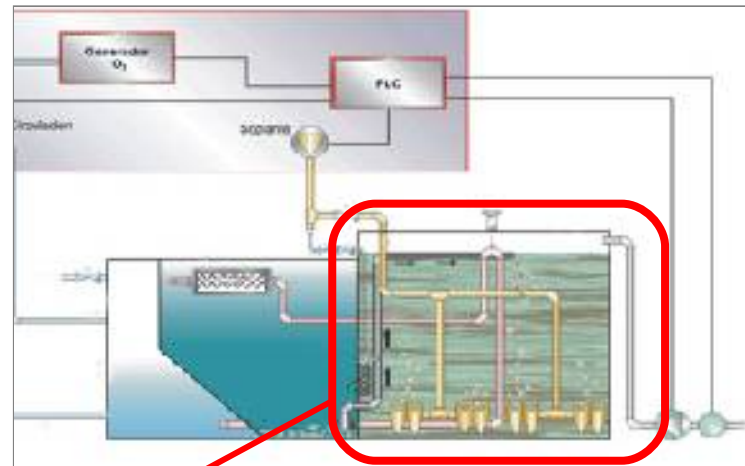
❖ PRETREATMENT

- Low revs operation.
- Flow regulation of incoming water.
- Shredding of solids under 5 mm
- Water pumping to the aeration chamber



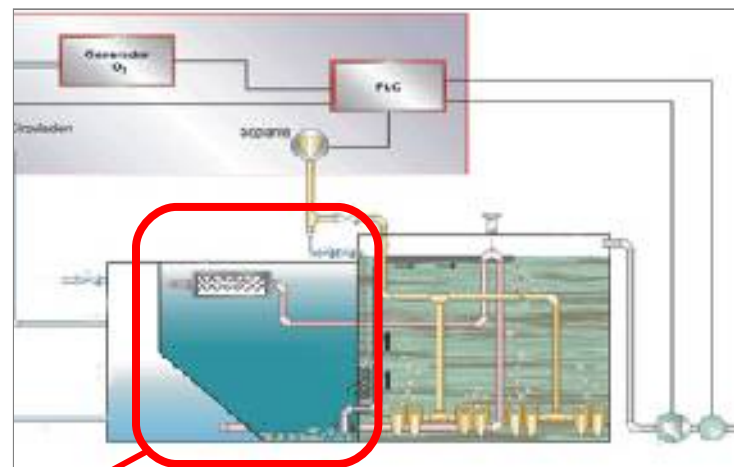
❖ BIOLOGIC TREATMENT

- Aeration chamber
- Endogenous Respiration
- Water body oxigenation
- Turbulent regime
- Growth of microorganism aeration
- Suspended sludge



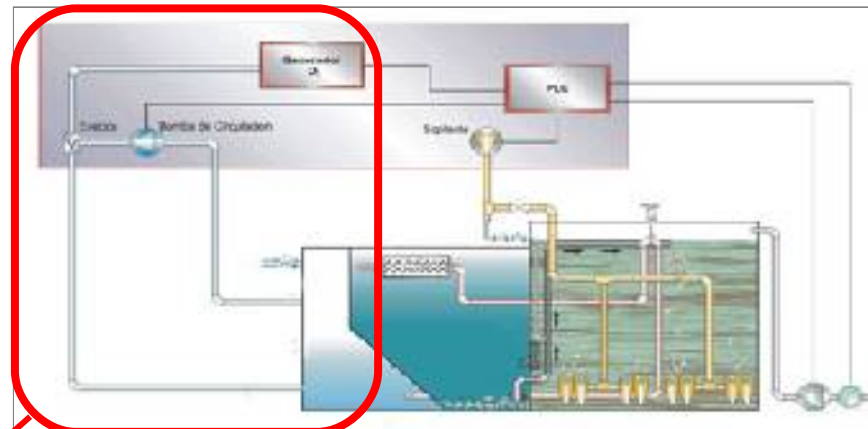
❖ DECANTATION

- Pressurized decantation
- Chamber as V
- Coalescing filters
- No turbulence
- Separation of sludge from water
- Sludge Periodic Recirculation



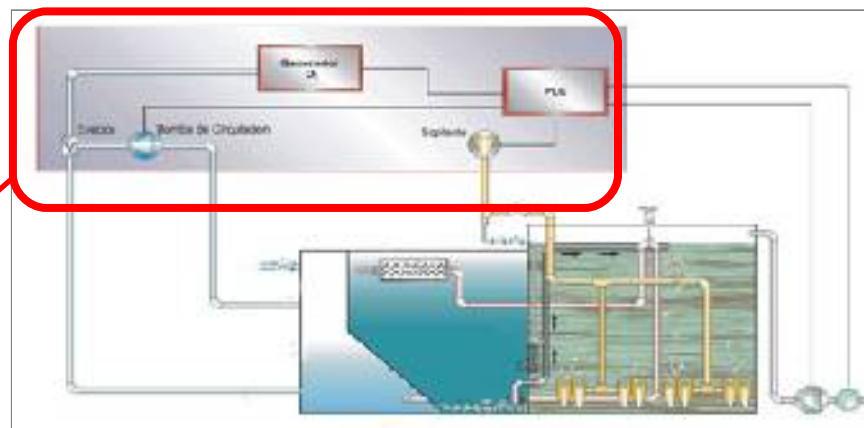
❖ DESINFECTION TREATMENT

- Ozone closed circuit
- Disinfection
- Deodorization
- Elimination of virus and bacteria

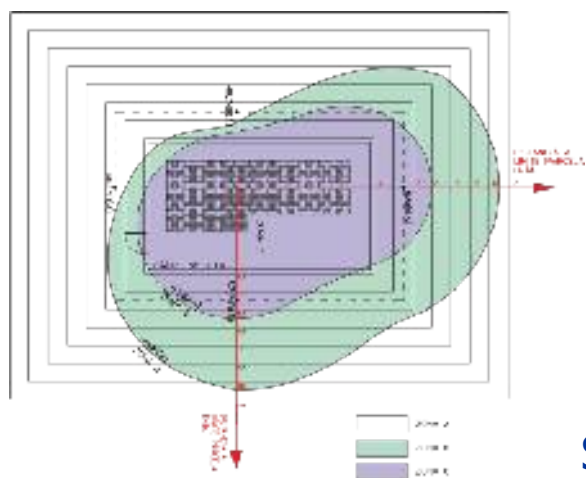


CONTROL CABIN

- Anti-vandalism Cabin
- Blower air supply
- Ozone generator
- Ozone recirculation pump
- Control Panel
- PLC
- Modem



MAIN ADVANTAGES



SOCIAL ACCEPTANCE

MAIN ADVANTAGES



SOCIAL ACCEPTANCE

MAIN ADVANTAGES



PACKAGE PLANT – EASY TO INSTALL

MAIN ADVANTAGES



MINIMUM AREA OCCUPIED

MAIN ADVANTAGES



MINIMUM AREA OCCUPIED

MAIN ADVANTAGES



MODULARITY

MAIN ADVANTAGES



SIMPLE BUILDING WORKS

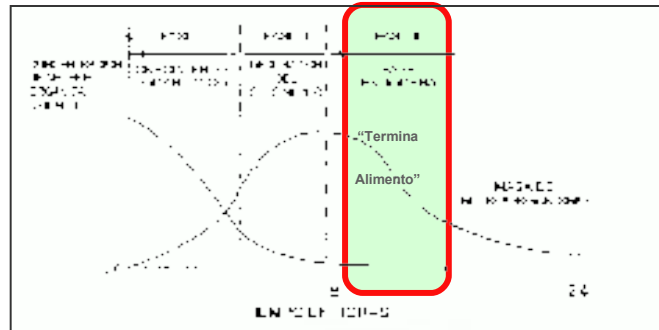
MAIN ADVANTAGES

The main idea of the extended aeration is eliminated residual sludge. This is the principal difference in comparison with others convencional process.

- Lower Organic load.
- Greater retention time in the reactor.
- Increased oxygen consumption.
- Higher solid concentration in the reactor.

REGARDING THE GROWTH OF MICROORGANISM AND FOOD CONCENTRATION.

R.S. RAMALHO: *Tratamiento de Aguas Residuales*, 1996



NO EXCEDENT SLUDGE REMOVAL

MAIN ADVANTAGES



NO ADDITIVES

MAIN ADVANTAGES

BEADE - San Andrés

Número de planta: 921104010401
 Tipo de planta: ETP 10
 Dirección: Avenida Prolongada, entre Avenida de las Naciones y Avenida de las Naciones
 Superficie: 9' 25 m² de
 Plantas: 1040
 Tipo: SAN ANDRÉS
 Ver en el mapa
 Contorno principal
 Código de planta
 Referencia de planta: Funcionamiento de la planta

Órdenes de riego

Id	Fecha de riego	Estado de riego	Fecha de riego	Fecha de riego	Fecha de riego
1040	10/10/2010	10/10/2010	10/10/2010	10/10/2010	10/10/2010
1040	10/10/2010	10/10/2010	10/10/2010	10/10/2010	10/10/2010
1040	10/10/2010	10/10/2010	10/10/2010	10/10/2010	10/10/2010

Órdenes de riego

Fecha	Hora	Estado de riego
10/10/2010	10:00	Ver Datos
10/10/2010	10:00	Ver Datos
10/10/2010	10:00	Ver Datos
10/10/2010	10:00	Ver Datos

Órdenes de riego

Fecha	Hora	Estado de riego
10/10/2010	10:00	Ver Datos
10/10/2010	10:00	Ver Datos
10/10/2010	10:00	Ver Datos
10/10/2010	10:00	Ver Datos

EACH MAINTENANCE
TECHNICIAN TAKES CARE
30-35 PLANTS

Each plant recorded in the system provides different types of users the most relevant information about its operation and interaction incidents technique. The system allows a telematic control (via SMS alert) of all plants built in the same group, as well as remote shutdown or reset.

ACCESSIBILITY

MAIN ADVANTAGES

Parameter	Ud.	STP-10	STP-16	STP-25	STP-50
Population Range	m ³ /day	100-175	175-275	275-425	425-700
Consume Ratio	KWh/m ³	1,4-1,6	1,4-1,6	1,4-1,6	1,3-1,5
Preventive maintenance	€/month	<300	<300	<300	<300
Additives	€/month	0	0	0	0
Sludge Management	€/month	0	0	0	0

LOW MAINTENANCE COST

PECC

Carrión de los Céspedes Experimental Plant (PECC) is a centre which has become a reference point of urban wastewater treatment in small rural communities both in Europe and in the whole Mediterranean area.

In a single area covering 35,000 m², a number of different treatment systems have been set up, where conventional and non-conventional technologies take pride of place, including combinations of them.



VALIDATION

This project has been developed thanks to the Center of New Technologies of Water (CENTA) and Carrión de los Céspedes Experimental Plant (PECC). The follow-up program was made according to " Test of Evaluation of Prototypes System pilots of Treatments of Waste water: Technological innovation in the Sector ".

The above mentioned Test of Evaluation has applied itself to determine the behavior of the unit FACET model STP operating with domestic waste water. For it, there have taken as a reference the check reports realized by the EPA (Environmental Protection Agency) about waste water treatment systems.

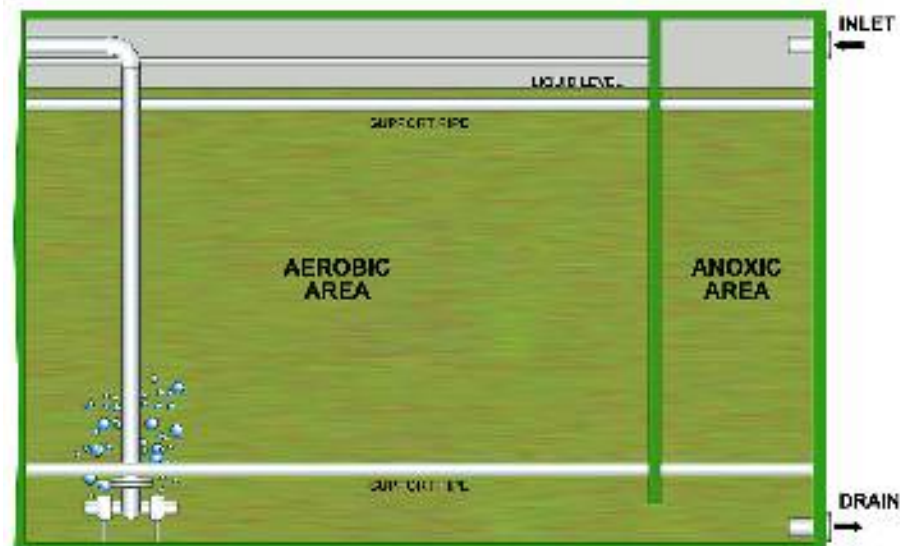
VALIDATION

The installation and putting in march of the waste water treatment system was realized during November 13, 2007. For his placement, it was necessary simply the help from a derrick truck. Once located, we proceeded to the electrical and mechanical connection of the equipment and filled with water, beginning this way the operating.

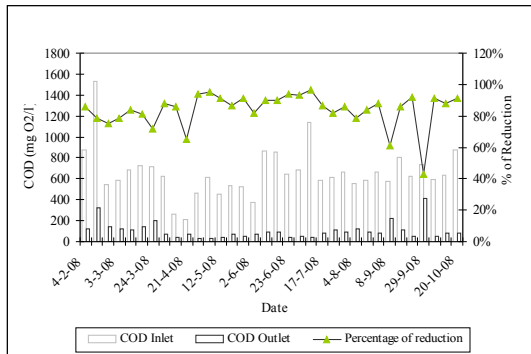
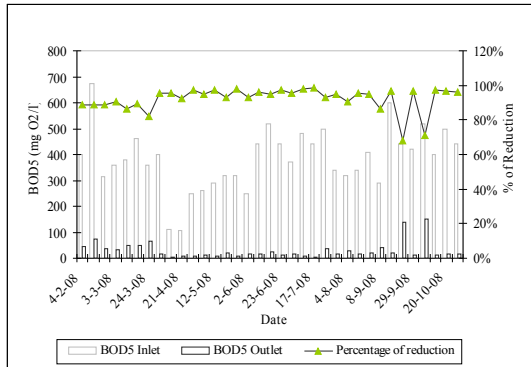
The program of sampling has consisted of the accomplishment of captures of weekly samples during a period of time of 12 months. Aliquots have been analyzed both of the unfluent one and of the effluent one of the sewage treatment plant.

VALIDATION

Later to the initial period of putting in march, the test of evaluation realized has divided in two phases due to a modification effected in the chamber of aeration so that in the second stage the biological reactor was divided in two zones: anoxic-aerobic (1er Period: February, 2008 to June 2008, 2^o Period: June, 2008 to October, 2008) with the aim to study the percentage of elimination of nutrients in the process.



VALIDATION



MAIN CONCLUSIONS

-HIGH EFFICIENCY IN THE REDUCTION OF POLLUTANTS DURING THE PHASE I

-OPERATING PROBLEMS DURING PHASE II DUE TO FALL OF THE WALL THAT IT WAS SEPARATING THE ANOXIC ZONE FROM THE AEROBIC ZONE

-INCREASE OF N AND P REMOVAL DURING PHASE II

-IT WAS NOT NECESSARY TO REMOVE EXCEDENT OF BIOLOGICAL SLUDGE DURING 12 MONTHS OF OPERATION

FUTURE DEVELOPMENTS

-IMPROVE THE SEPARATION SYSTEM BETWEEN ANOXIC ZONE AND AEROBIC ZONE

-INTRODUCE A FRECUENCY CONVERTER IN ORDER TO REDUCE ELECTRICAL CONSUMPTION

-INCORPORATE A UPS TO SEND SIGNAL IN CASE OF POWER FAILURE

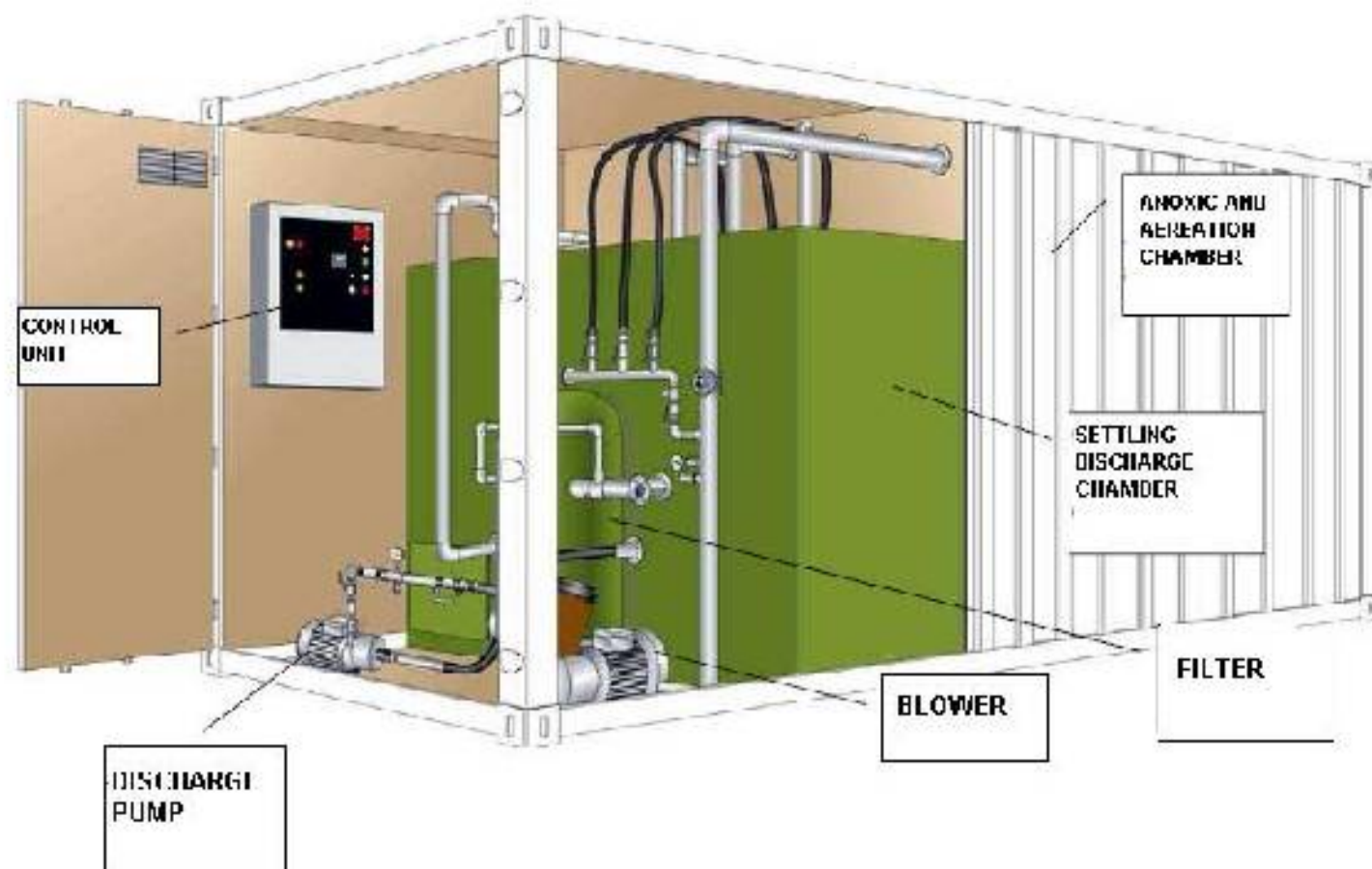
-PROPOSE THE INTRODUCTION OF SOLAR PANELS

UPCOMING PROJECTS



TECHNICAL VALIDATION SMS REGENERATION PLANT

SMS UNIT



THANK YOU FOR YOUR KIND ATTENTION

WE INVITE YOU TO VERIFY THE FUNCTIONING
OF OUR EQUIPMENTS IN PECC



e-mail: rafael.dopazo@smasa.net