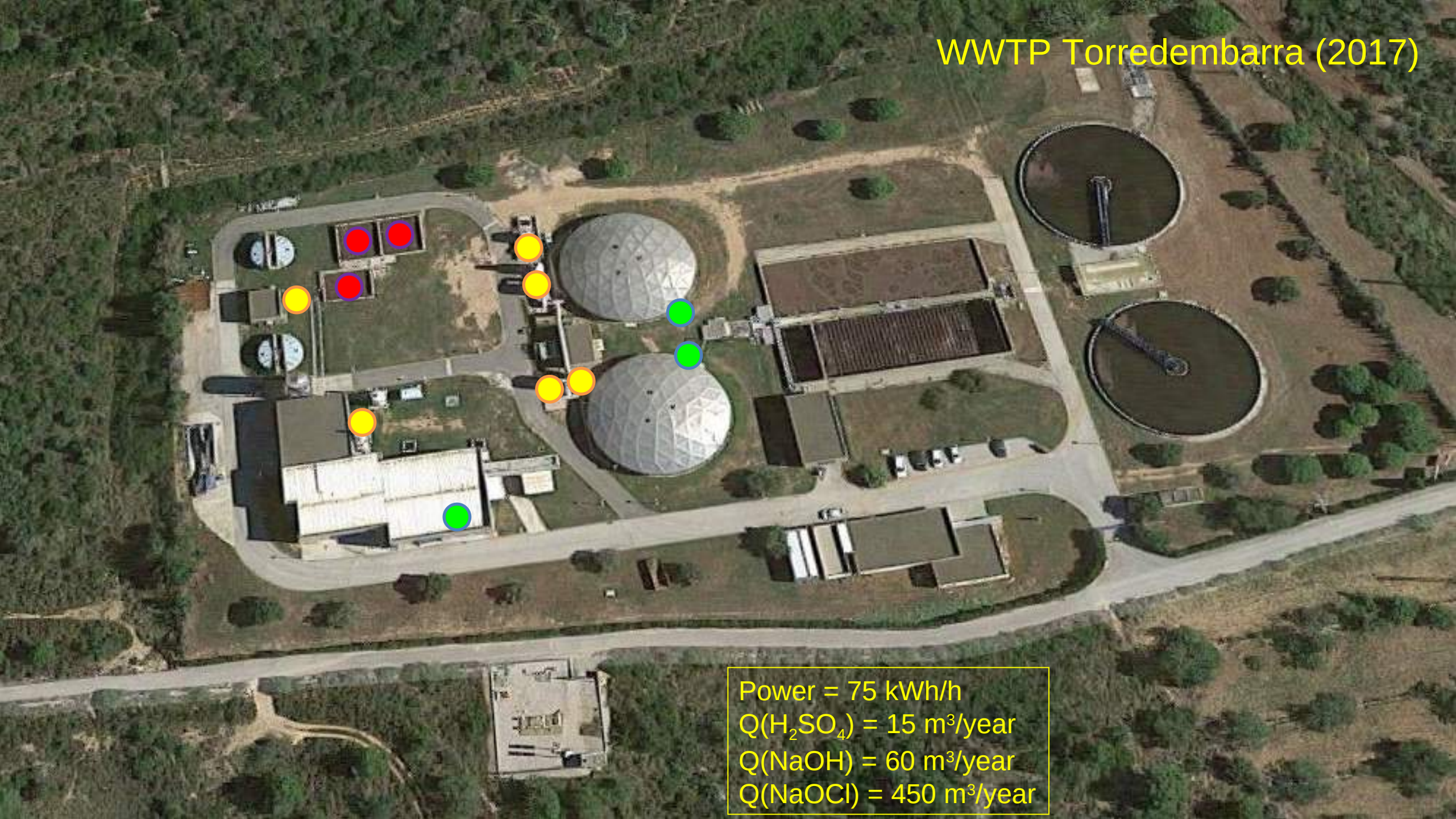


TECHNICAL AND ECONOMIC OPTIMIZATION OF THE DEODORIZATION OF A
COASTAL WWTP THROUGH BIOLOGICAL PROCESSES

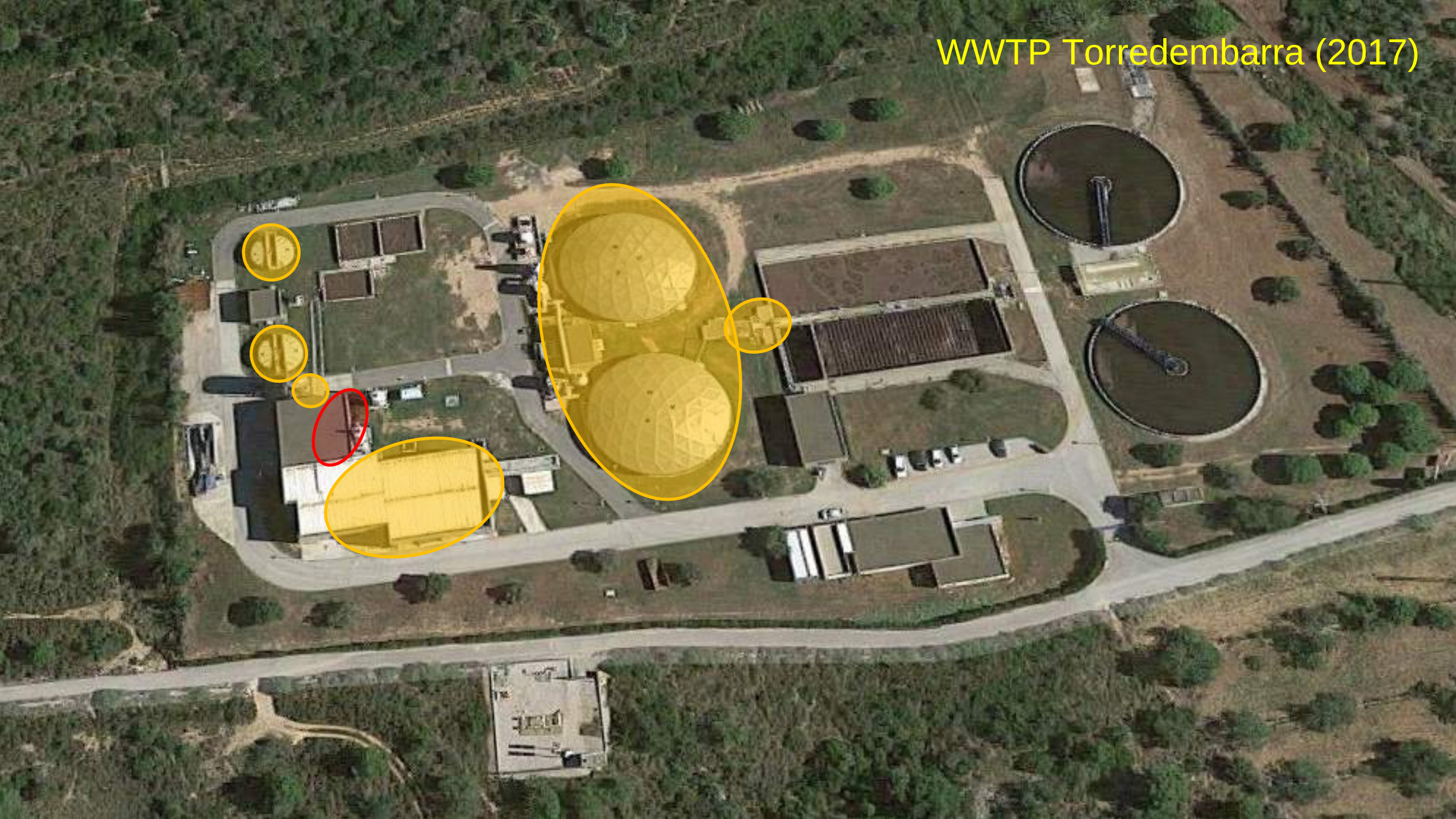
Josep Torà, Elvira César, Lidia Saúco, Maria Pignatelli, Jordi Robusté, Óscar Prado

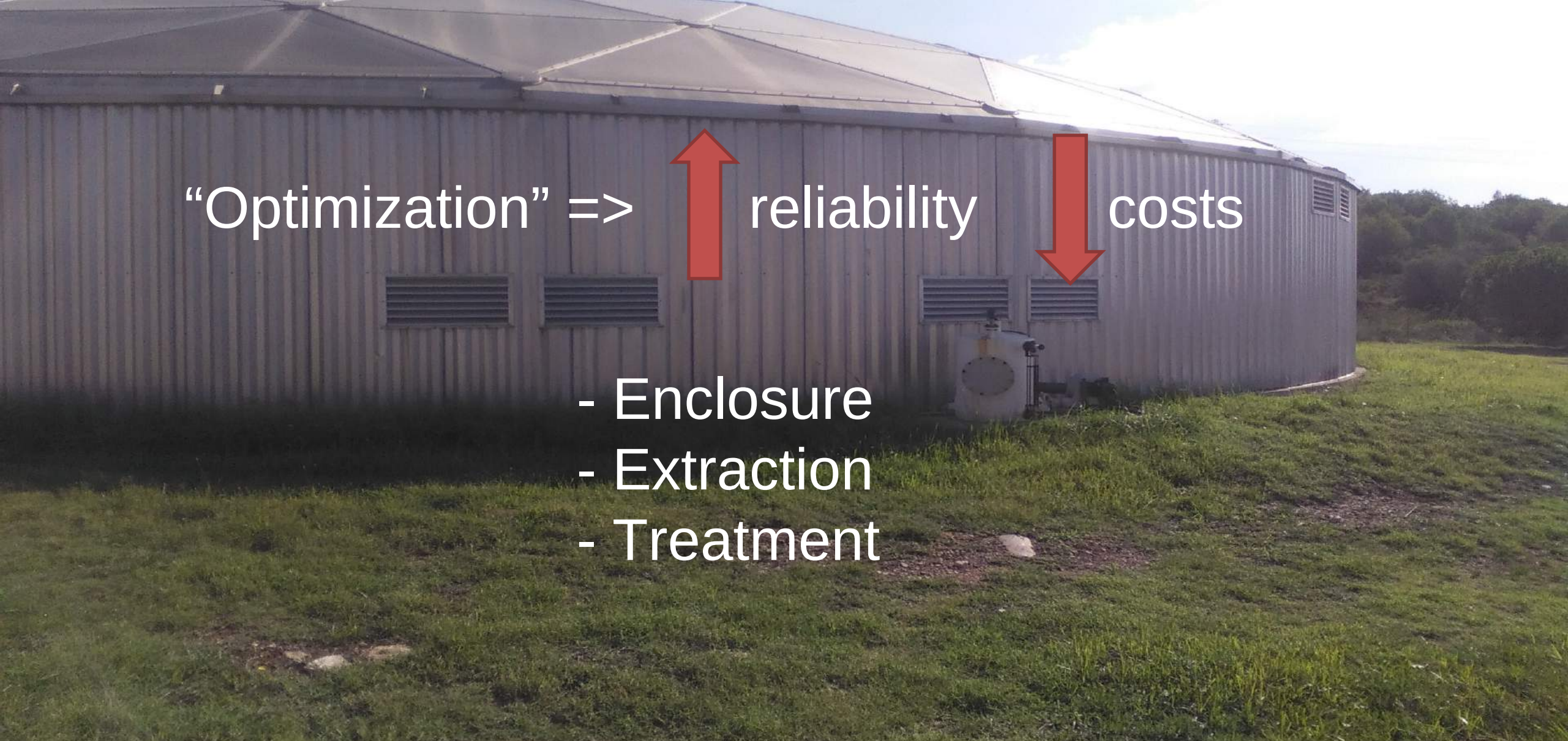
WWTP Torredembarra (2017)



Power = 75 kWh/h
 $Q(\text{H}_2\text{SO}_4) = 15 \text{ m}^3/\text{year}$
 $Q(\text{NaOH}) = 60 \text{ m}^3/\text{year}$
 $Q(\text{NaOCl}) = 450 \text{ m}^3/\text{year}$

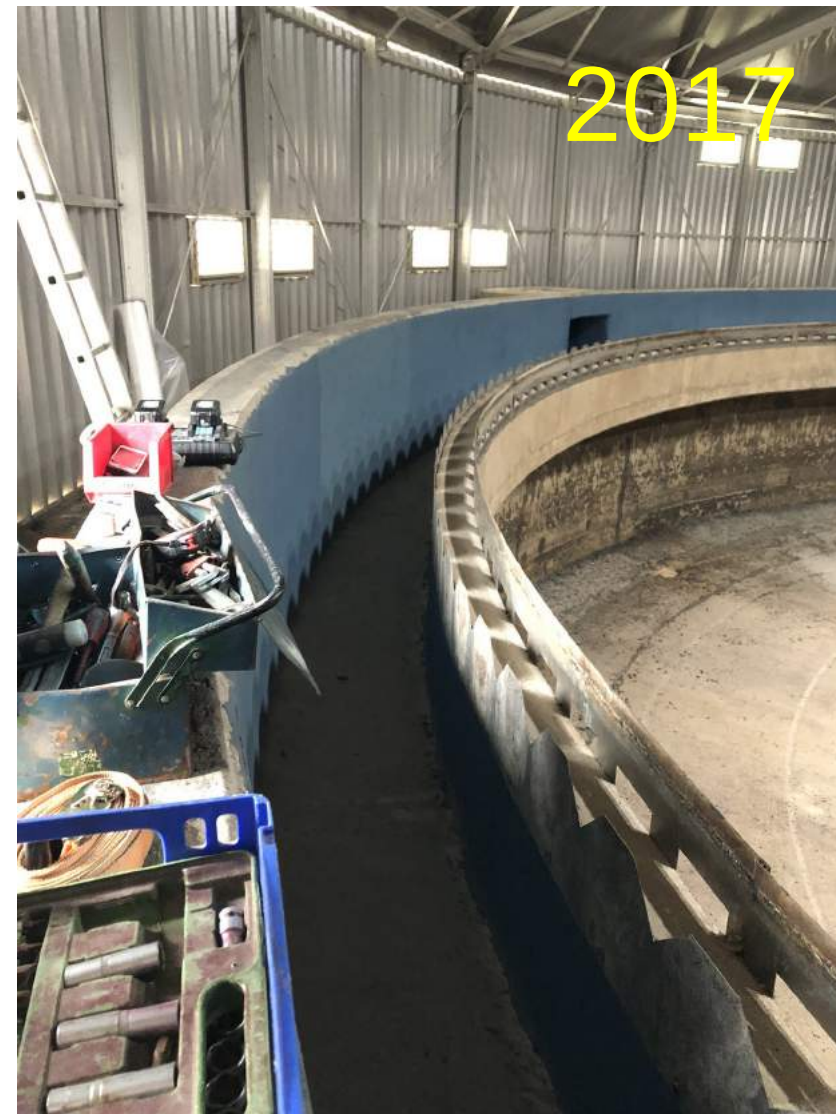
WWTP Torredembarra (2017)





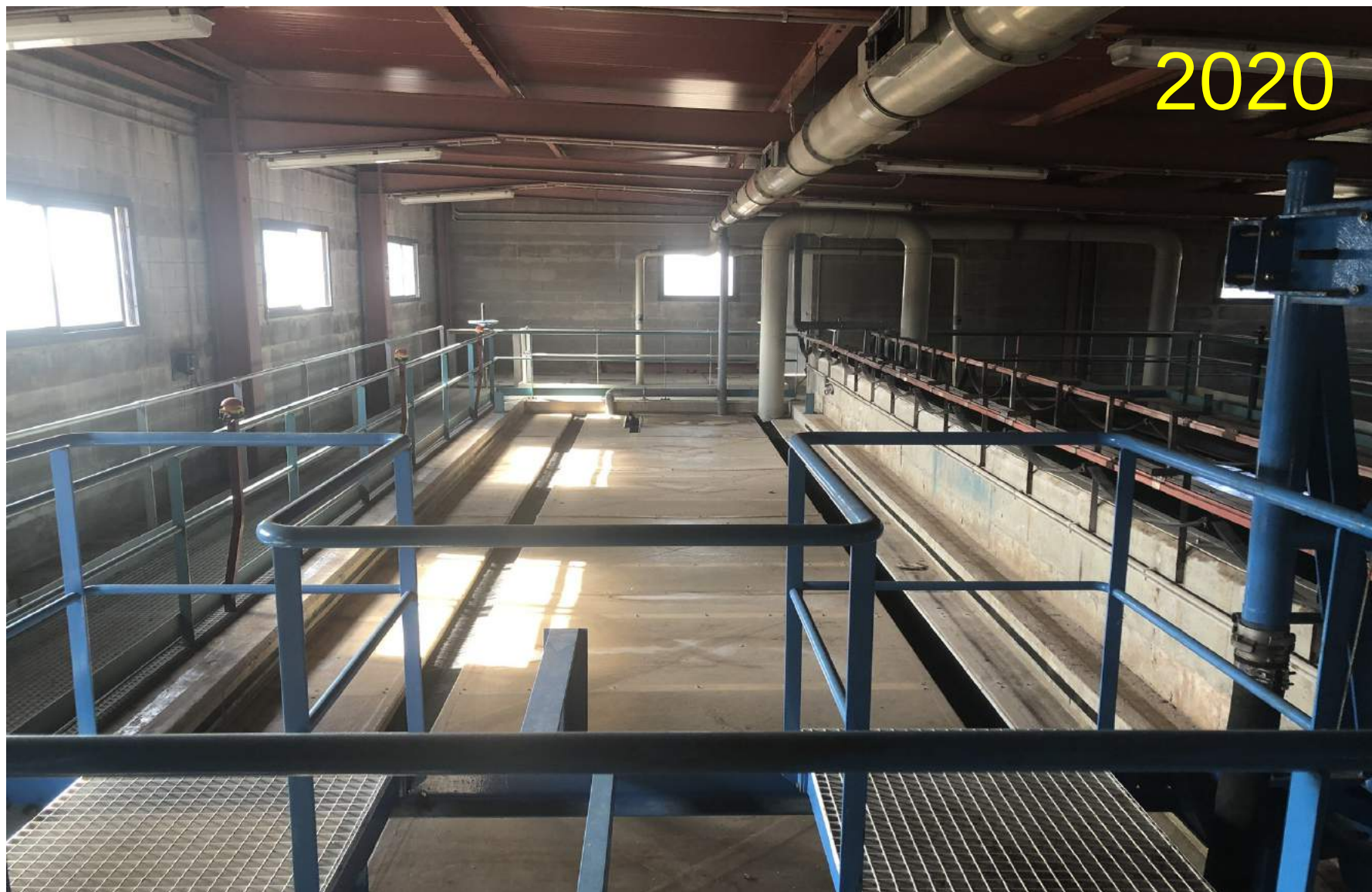
“Optimization” =>  reliability  costs

- Enclosure
- Extraction
- Treatment

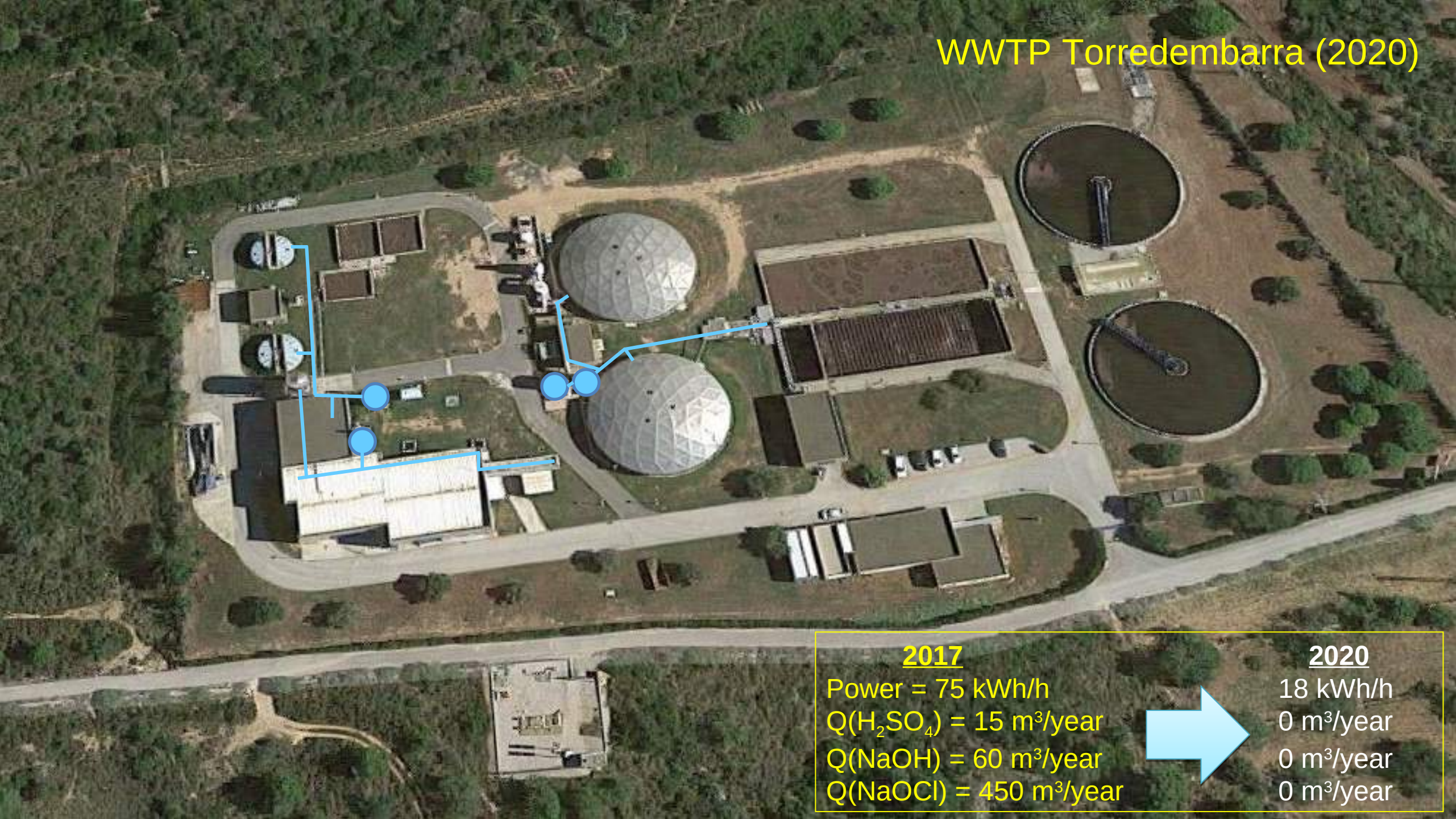








WWTP Torredembarra (2020)



2017

Power = 75 kWh/h
 $Q(\text{H}_2\text{SO}_4) = 15 \text{ m}^3/\text{year}$
 $Q(\text{NaOH}) = 60 \text{ m}^3/\text{year}$
 $Q(\text{NaOCl}) = 450 \text{ m}^3/\text{year}$



2020

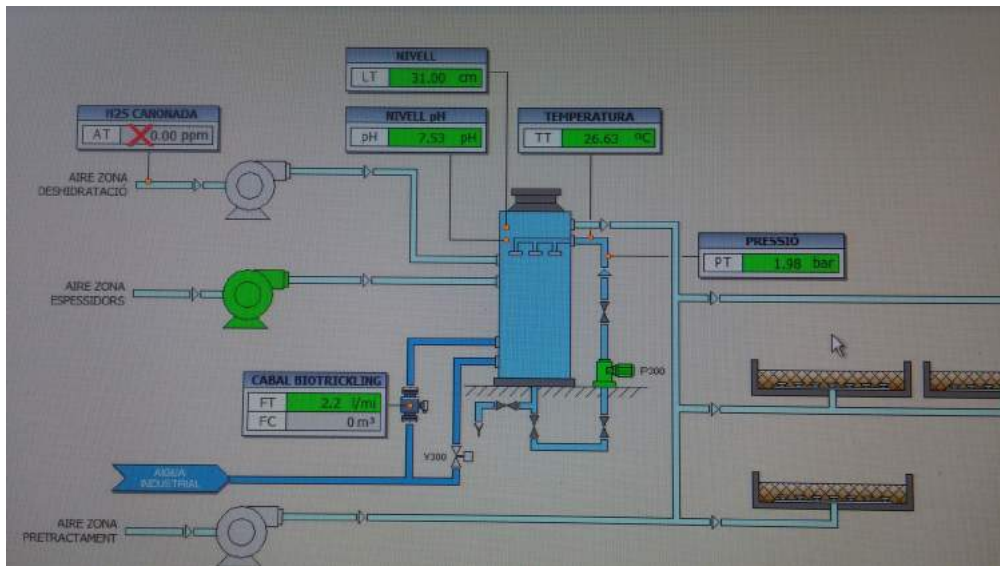
18 kWh/h
0 m^3/year
0 m^3/year
0 m^3/year

Treatment: Dewatering building + thickeners

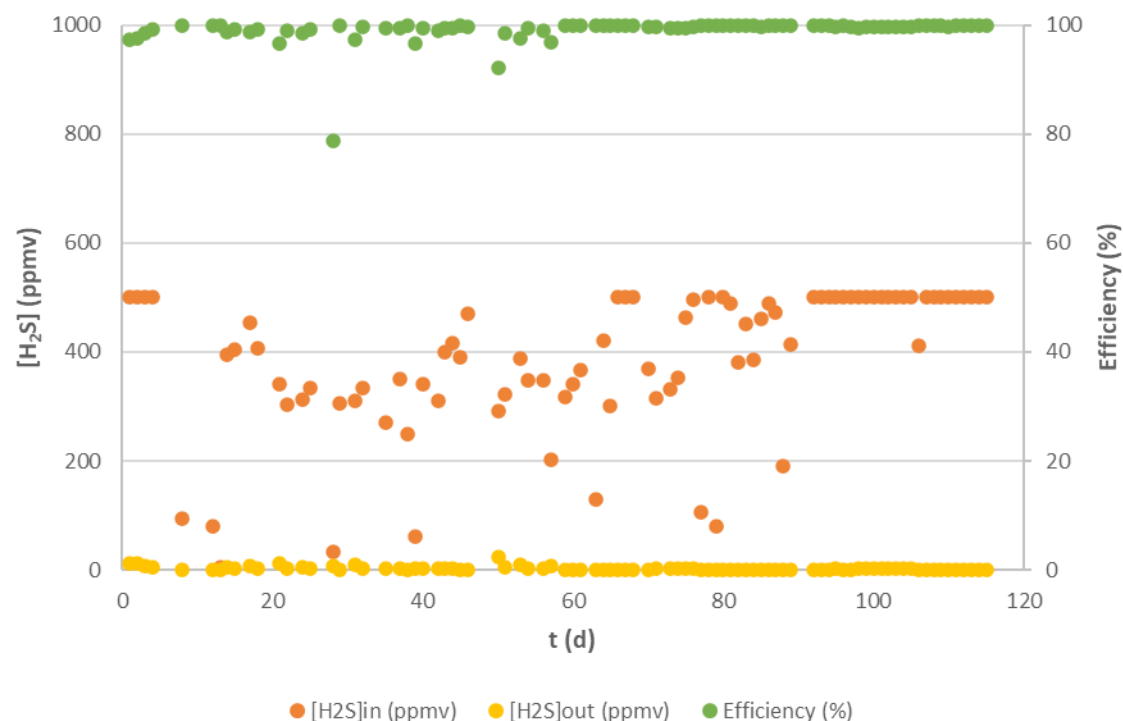
FR = 3500 m³/h

50 < [H₂S] < 800 ppmv

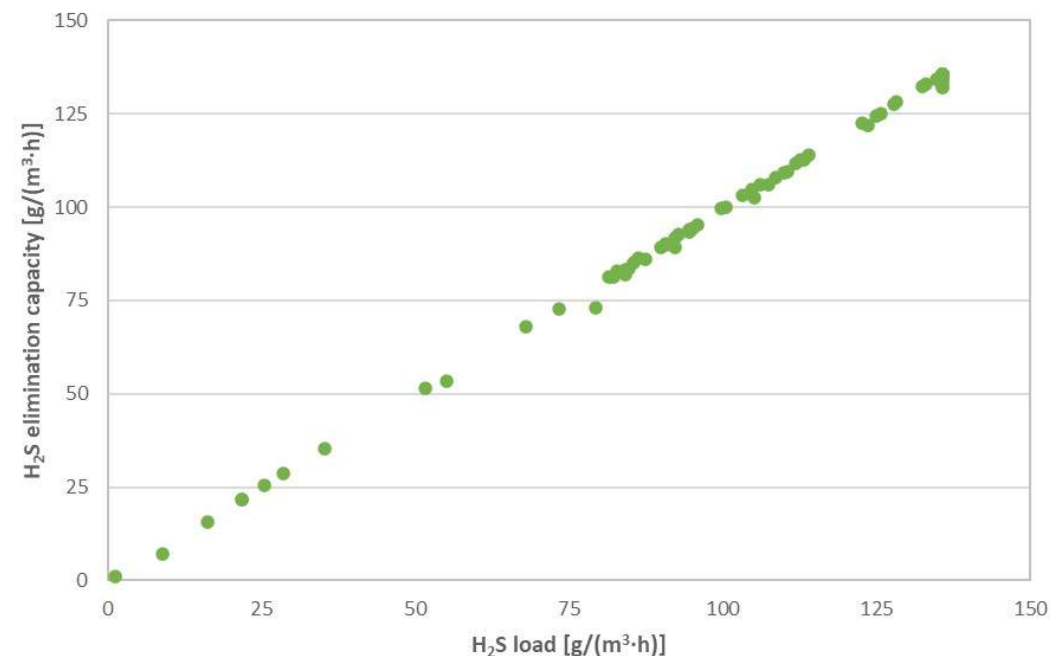
2,4 m (d) x 7,1 m (h)



Treatment: Dewatering building / thickeners



$[H_2S]_{in} > 389 \pm 130$ ppmv
 $[H_2S]_{out} = 2,1 \pm 3,6$ ppmv
RE $> 99,2 \pm 2,5$ %

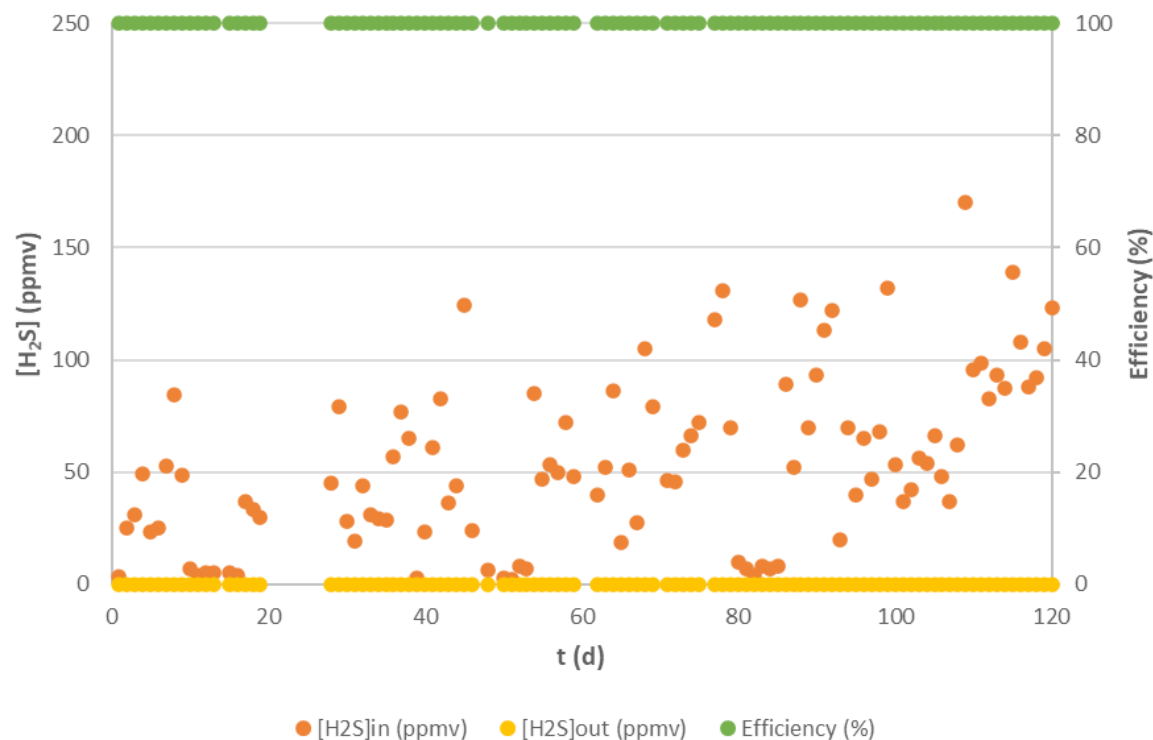


H_2S Load $> 105,5 \pm 35,5$ $g/(m^3 \cdot h)$
 H_2S E.C. $> 104,9 \pm 35,5$ $g/(m^3 \cdot h)$
Critical load $> 135,7$ $g/(m^3 \cdot h)$

Treatment: Sludge storage tank + pretreatment

FR = 4000 m³/h
5 < [H₂S] < 170 ppmv
2,4 m (d) x 7,6 m (h)

[H₂S]_{in} = 56,0±36,8 ppmv
[H₂S]_{out} = 0,0±0,0 ppmv
RE > 100,0±0,0 %



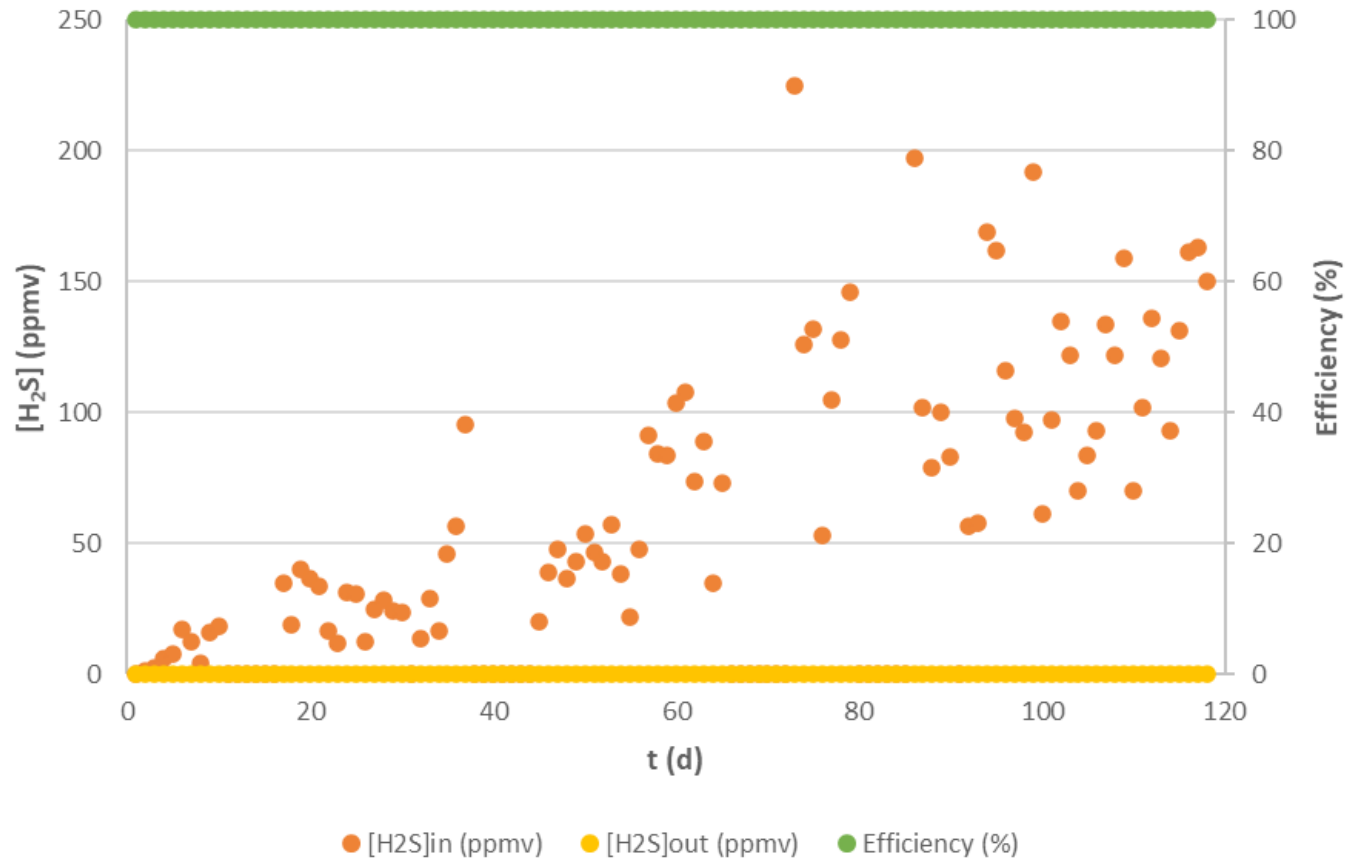
Treatment: Primary settlers + distribution tanks

Two chemical scrubbers
retrofitted into biotrickling
filters (Gabriel & Deshusses, 2003)

FR = 7000 m³/h
 $0 < [\text{H}_2\text{S}] < 230$ ppmv



Treatment: Primary settlers + distribution tanks



$[H_2S]_{in} = 55,8 \pm 55,5$ ppmv

$[H_2S]_{out} = 0,0 \pm 0,0$ ppmv

RE = $100,0 \pm 0,0$ %

H_2S Load = $31,4 \pm 31,2$ g/(m³·h)

H_2S E.C. > $31,4 \pm 31,2$ g/(m³·h)

Critical load > 126,5 g/(m³·h)

Take-home ideas...

Deodorization in WWTP requires an integral assessment

Biological technologies (BTF) are technically adequate for WWTP deodorization (efficiency >99%)

Operating costs are dramatically reduced (>6-fold)

THANK YOU!



Depuración de Aguas
del Mediterráneo



**Agència Catalana
de l'Aigua**



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