



**CIE**

WASTE WATER TREATMENT &  
ZERO LIQUID DISCHARGE PLANTS

ITALY

[www.cieeng.com](http://www.cieeng.com)

# PURAL

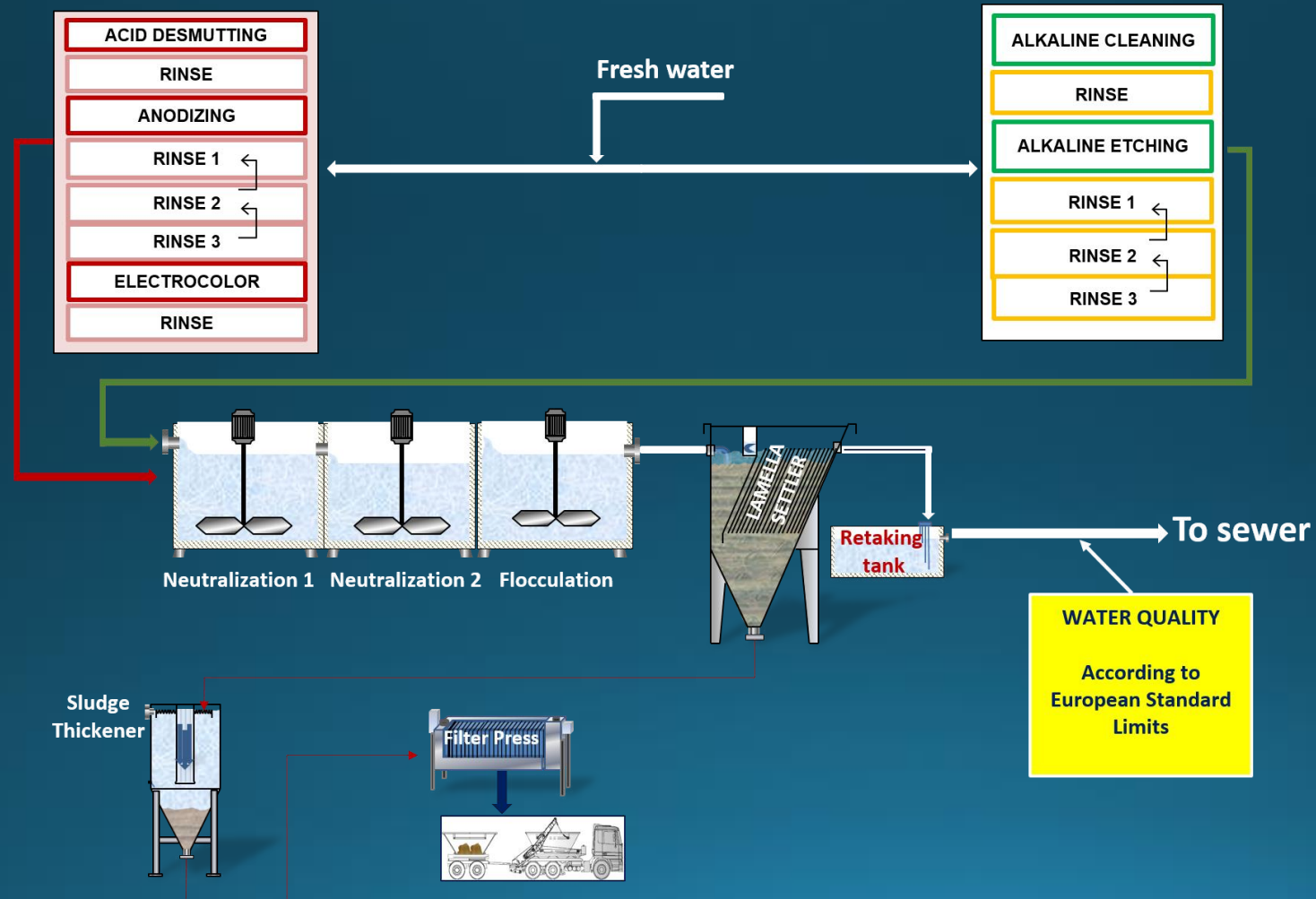
exclusive technology  
to reuse from 50% up to 100% of waste water  
from Anodizing and Painting lines.

# Current WWTP technology

LIMITS	TECHNOLOGY
European Limits for sewer discharge	Lime neutralization + Fluorides reduction
European Limits river/lakes discharge or irrigation purpose	Lime neutralization + Severe Fluoride reduction with chemical specialties
Special local limits <ul style="list-style-type: none"><li>▪SO<sub>4</sub> &lt; 300 ppm</li><li>▪F<sup>-</sup> &lt; 2 ppm</li></ul>	Special equipment and chemical specialties required

- Special dedicated section;
- Expensive chemical specialties required.

# Standard WWTP for anodizing lines



# PURAL technology

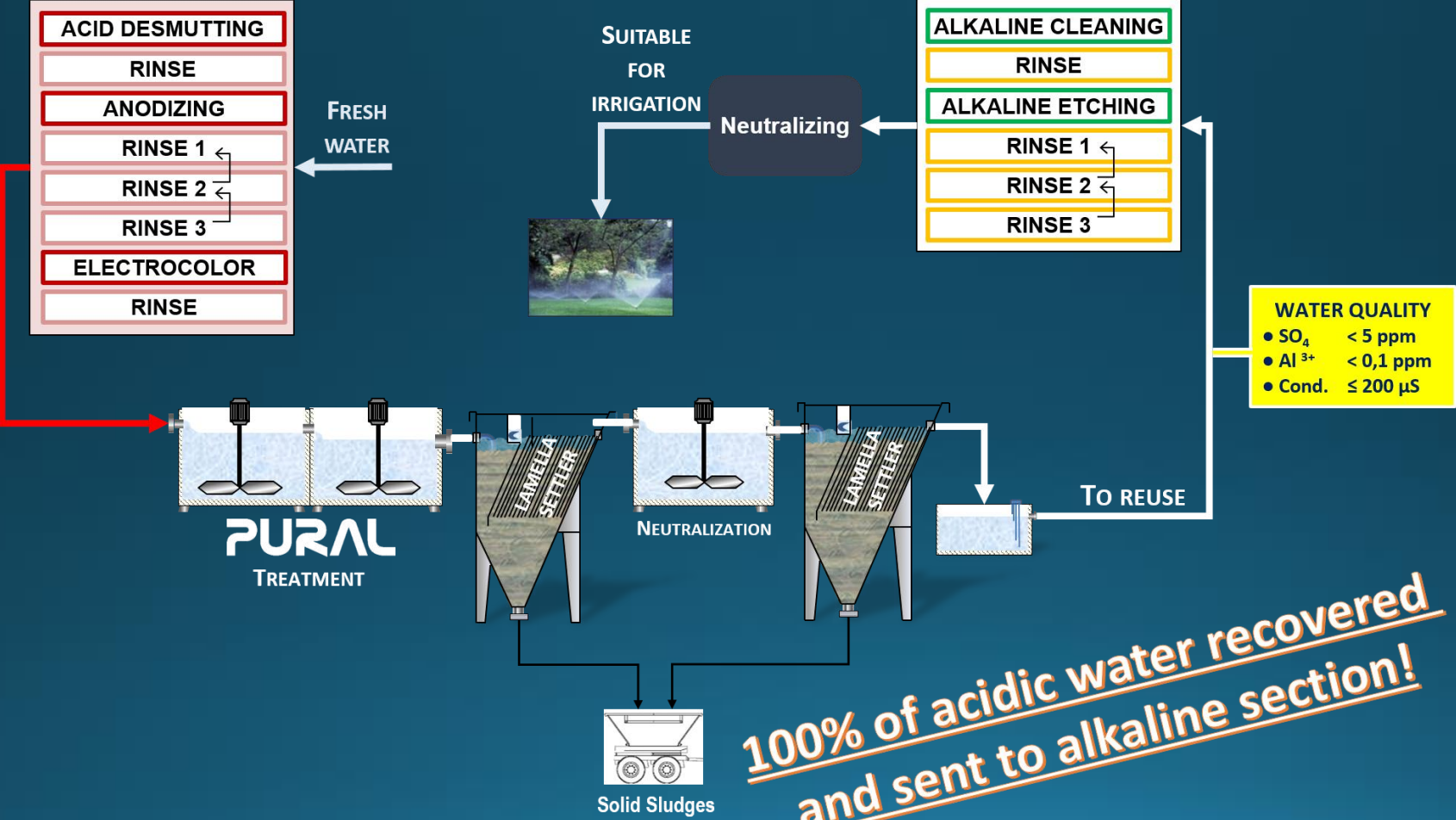
- Chemical technology to depress:
  - 95% of  $\text{SO}_4$
  - 98% of  $\text{F}^-$
  - 98% of Al
- Resulting water parameters:

Al	< 1 ppm
$\text{SO}_4$	< 150 ppm
$\text{F}^-$	< 2 ppm
Conductivity	< 400 ppm

# PURAL technology

- CIE and MST Chemicals R&D;
- Sulphates, Fluorides and Aluminium chemical removal;
- NO use of any barium derivate;
- NO I.X. or R.O. or Evaporator equipment;
- 100% of reusable water

# PURAL for anodizing lines

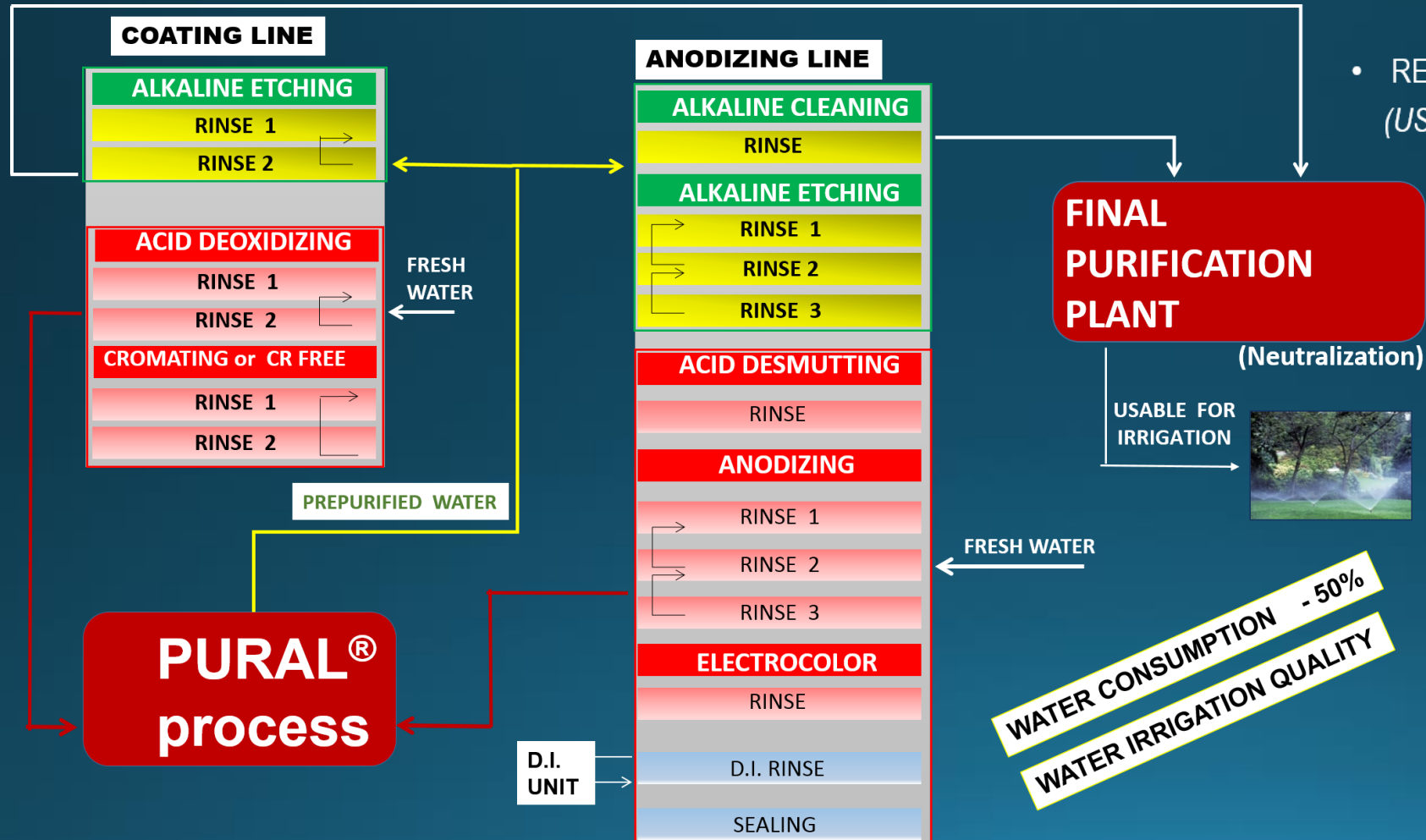


**100% of acidic water recovered and sent to alkaline section!**

# PURAL case history: TALEX

- TALEX (Abu Dhabi) has three lines
  - 1 Anodizing line for 7 meters extrusions
  - 1 Anodizing line for 11 meters extrusions
  - 1 Painting line for 7 meters extrusions, Cr-free equipped
- Total production
  - 650 sqm/h of Anodizing
  - 700 extrusions (7 meters high) per h
- TALEX works 24h/day and the original water consumption was 50 m<sup>3</sup>/h

# PURAL case history: TALEX



- STANDARD WATER CONSUMPTION: 50 m<sup>3</sup>/h
- RESULTING WATER CONSUMPTION: 25 m<sup>3</sup>/h  
(USING PURAL TECHNOLOGY)

Resulting water parameters:	
SO <sub>4</sub>	< 150 ppm
F <sup>-</sup>	< 2 ppm
Al <sup>3+</sup>	< 1 ppm

**WATER CONSUMPTION - 50%**

**WATER IRRIGATION QUALITY**



# PURAL ZEROZERO

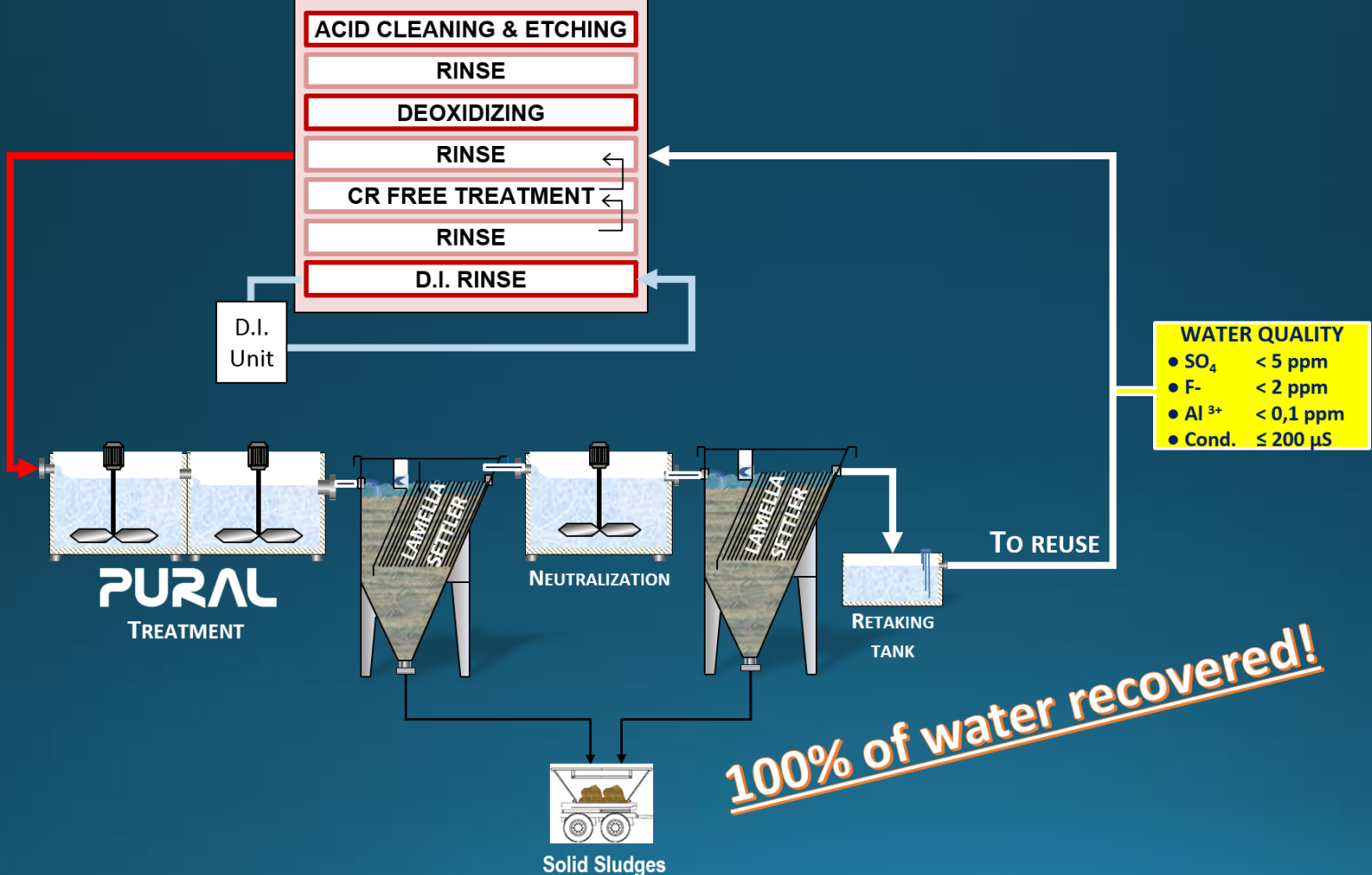
- Revolutionary patent pending technology to realize a ZLD with impressive characteristics:
  - **NO** Ultra Filtration or Reverse Osmosis required;
  - **NO** Evaporator required;
  - **NO** final liquor to dump;
  - **NO** Ion Exchange resin technology.
- **PURAL** ZEROZERO technology is applicable exclusively to:
  - Aluminium Painting lines with Acidic cycle with Cr-free coat
  - Acidic sections of Anodizing lines (Neutralizing, Anodizing, EC)



# PURAL ZEROZERO performances

- 98% of water recycled
- Zero Thermal Energy!
- Zero Liquid Discharge!
- Superior water quality ( $\lambda < 200 \mu\text{S}$ )
- Installation costs reduced by 30%
- Running costs reduced by 40%

# PURAL ZEROZERO for painting lines



**100% of water recovered!**

# PURAL ZEROZERO applications

- Thanks to its flexibility the plant realized using **PURAL ZEROZERO** can be used in three different versions:



To reuse 100% of water by recycling (ZLD)

- NO Ion Exchange
- NO Reverse Osmosis
- NO Evaporator
- NO Liquor to dump



For irrigation or to respect ANY severe limit such as:

- Sulphates < 300 ppm
- Aluminium < 0,1 ppm
- Fluorides < 4 ppm



To dump according to European limits

# Recent CIE experiences

## STANDARD ZLD PLANT



 **ELVAL**  
HELLENIC ALUMINIUM INDUSTRY S.A. (Greece)

## PURAL ZERO ZERO PLANT



 **TALEX** (Abu Dhabi)

**ZLD plant  
Sulphates and Fluorides  
treatment**



**ZLD plant – U.F. and R.O. view**

**ZLD plant  
Triple stage evaporator**



# TALEX - (Abu Dhabi)

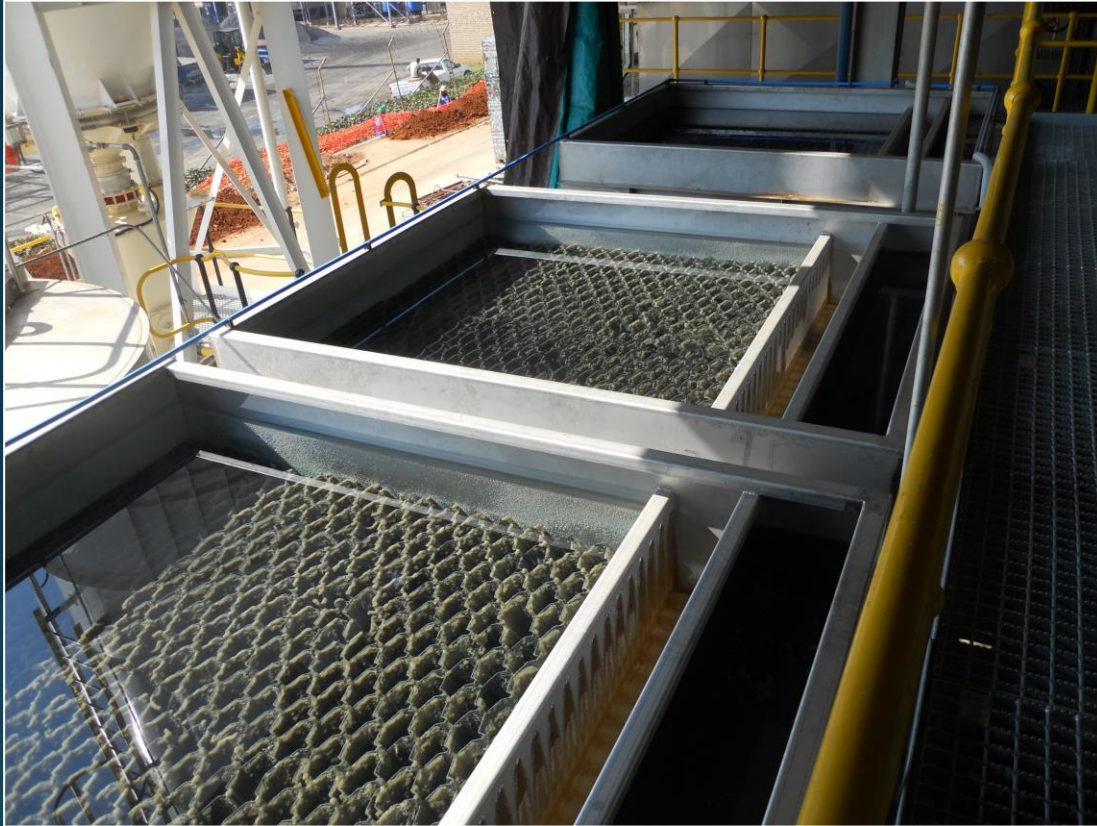


**PURAL ZEROZERO**  
Waste water buffer Tanks

## **PURAL ZEROZERO** Water purification and settling station



# TALEX - (Abu Dhabi)



**PURAL ZEROZERO**  
Lamella settlers battery

**PURAL ZEROZERO**  
Sludge thickeners battery





# TALEX - (Abu Dhabi)



**PURAL ZEROZERO**  
Lamella settlers battery

**PURAL ZEROZERO**  
Electric control board, PLC  
and Teleassistance unit





WASTE WATER TREATMENT &  
ZERO LIQUID DISCHARGE PLANTS



ITALY

[www.cieeng.com](http://www.cieeng.com)

*Thank you for your attention!*

Franco Falcone – CIE General Manager

Visit us at our table in the exhibition area