

# **A new Perception of Sludge Management: Role of Regulation and Standardization**

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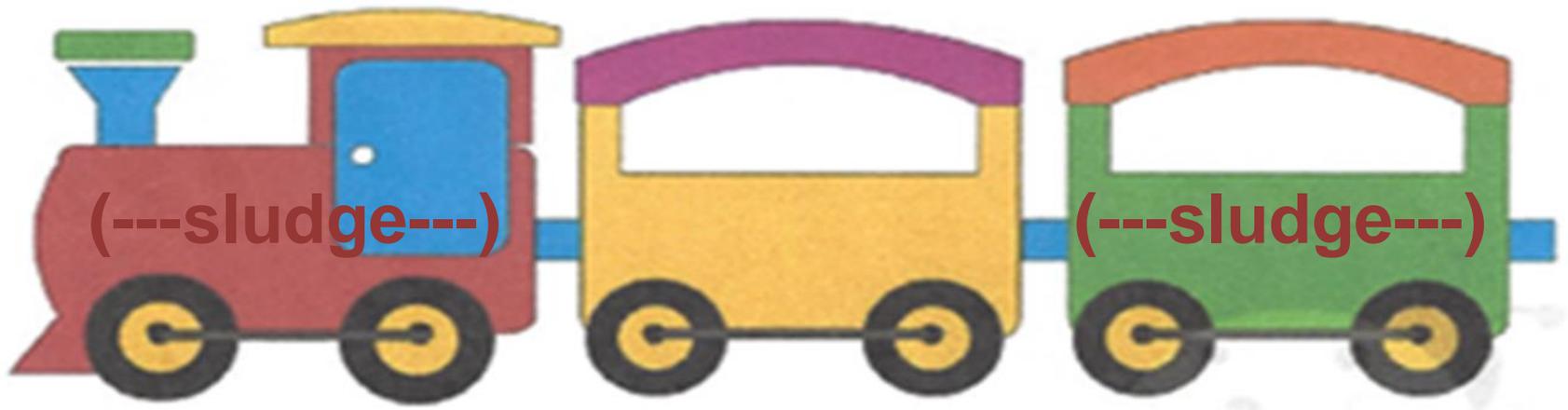
Traditionally, sludge management is often addressed after it has already been produced being sludge considered, also conceptually, the

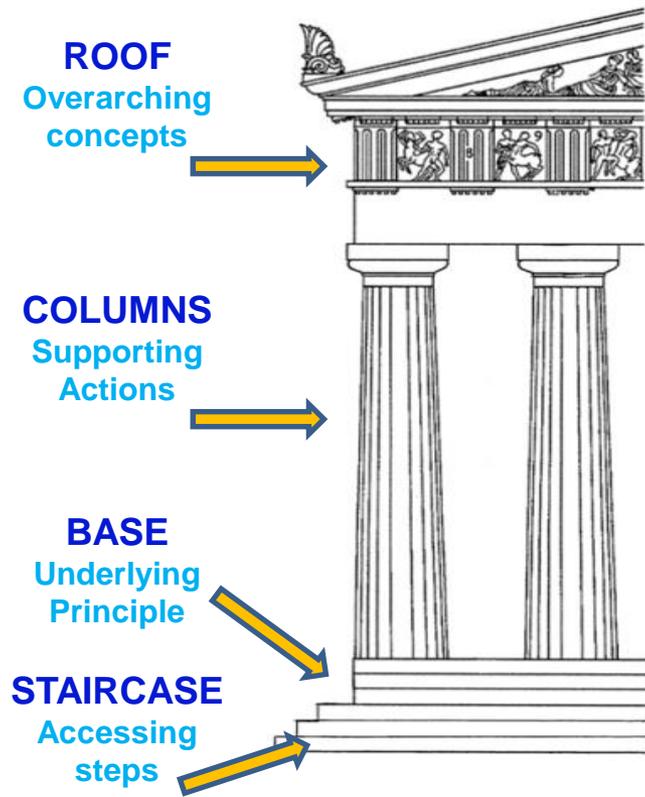
“last wagon of the water cycle train”

while it should be considered the

“locomotive”

being the most appropriate choices for the wastewater treatment plants strongly determined by the final reuse or disposal options for sludge.





This new perception is based on the:

- *Locomotive / Last wagon* concept, acting as **Base / Underlying principle**,

and includes both:

- “*Technical*” aspects (Reduction of Production; Improvement of quality; Recovery maximization; System optimization), and often underestimated “*Institutional and Social*” ones, acting as **Columns / Supporting actions**,

which for their effective application have to:

comply with:

- general and always valid “*Basic principles*” (Laws of thermodynamics, Sustainability principles and Circular economy concepts), acting as **Roof / Overarching concepts**,

and fall within:

- specific “*Boundary conditions*” (Isolated/Integrated processes; Past/Future concepts; Disposal/Recovery options), acting as **Staircase / Accessing steps** which depend on the technological, economic and social levels of the context where operations take place.

# Technical aspects

- Reduction of production
- Improvement of quality
- Recovery maximization
- System optimization

# Institutional / Social aspects

- ❖ Regulation / Characterization
  - ❖ Local circumstances
    - ❖ Legal pluralism
    - ❖ Access barriers
    - ❖ Pricing mechanisms
- ❖ Rules of the game / Game of the rules

# Institutional aspects

## Regulation 1 / Characterization

The development of “*realistic and enforceable rules and regulation*” is important because optimal and safe sludge management can only be achieved through objective, transparent, and legally conducted operations.

Regulations should avoid the imposition of:

- “**generic and not numerically quantified**” limits that may have general applicability, but are difficult to apply widely;
- “**numerically quantified but not justified**” limits, which can also become dangerous in some situations



# Institutional aspects

## Regulation 2 / Characterization

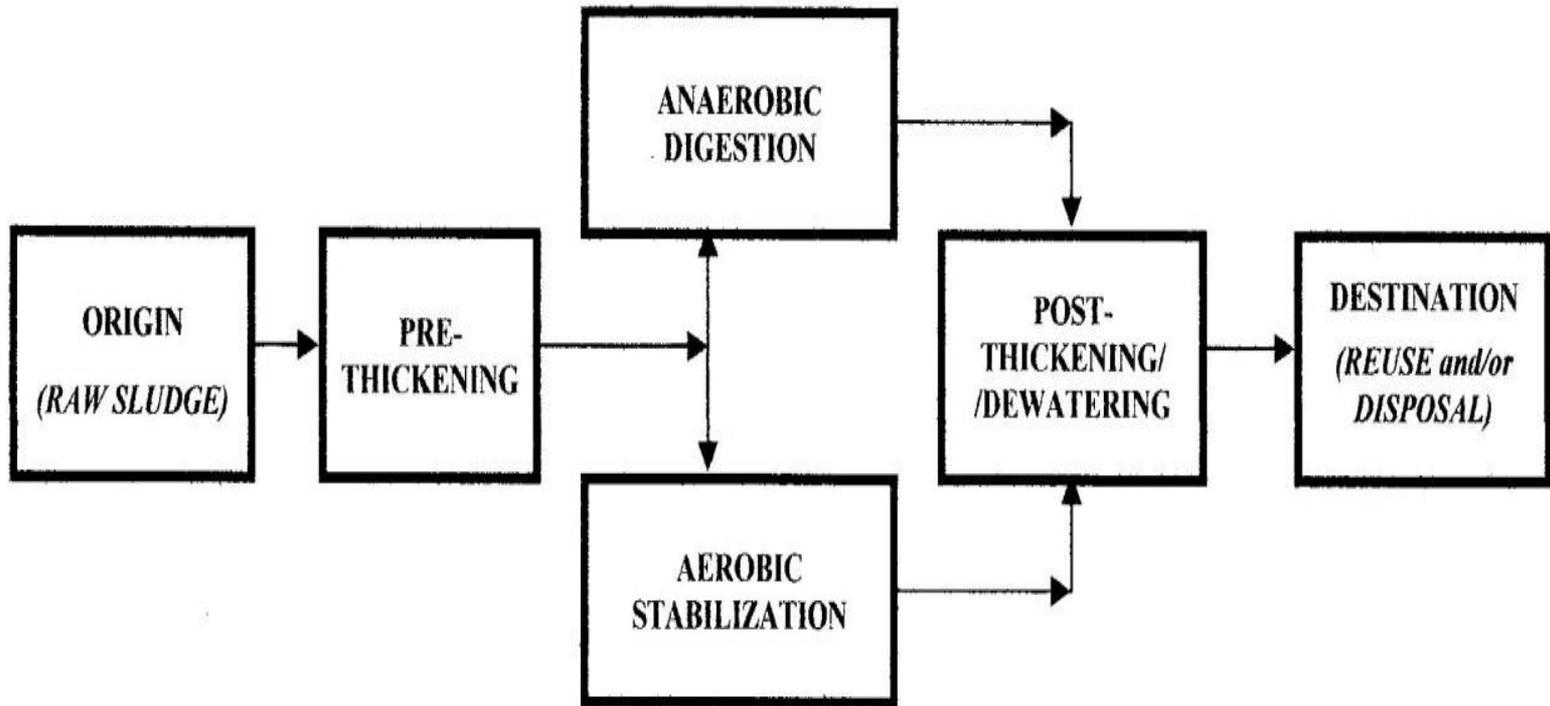
Furthermore, it must be remembered that regulations, included those on sludge, cover a wide range of scales, from **national** to **regional** and **local** ones, and fall not only in the water and sanitation sectors, but also in the health, agriculture and planning / construction sectors.

# Institutional aspects

## Regulation / Characterization 1

One must remember the importance of development of characterization standardized procedures to assess the properties of sludge and their predictable behavior.

That's because well-defined procedures allow to meet the legal requirements in a fair and uniform manner, allowing a reliable comparison of the results obtained under different conditions, thus building stakeholders and public confidence.



# Institutional aspects

## Regulation / Characterization 2

Regarding the evaluation of sludge **quality**, the parameters are numerous depending on the objective of the evaluation.

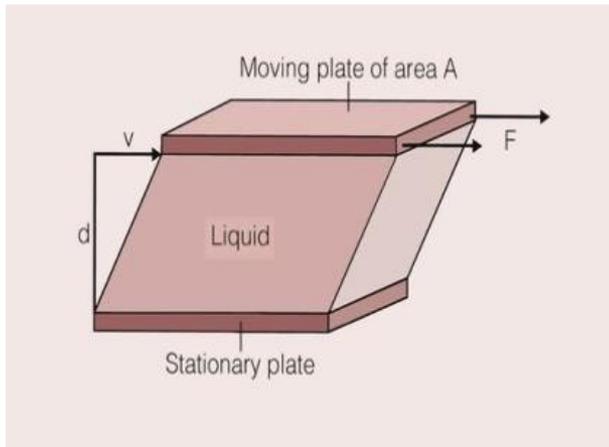
In particular, the assessment of biological stability, despite the presence of many methods available, is subject to the lack of an widely accepted definition of stability.

With reference to the reduction of the **quantity** of sludge production, parameters of primary importance are Sedimentability, Thickenability, Drainability, CST, Specific resistance to filtration, Compressibility and Centrifugability.

# Institutional aspects

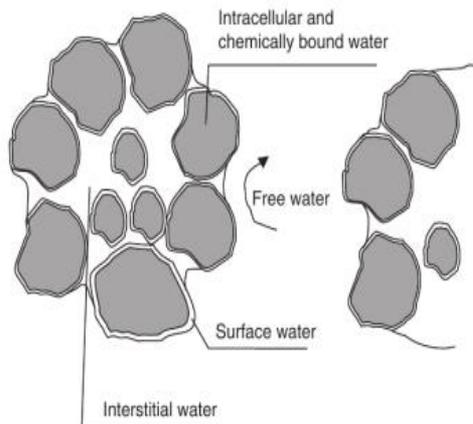
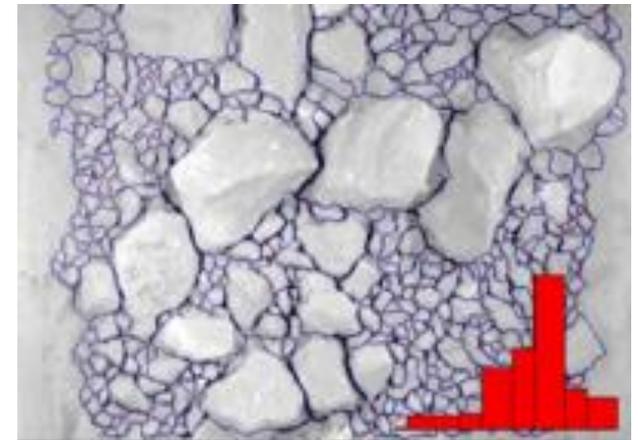
## Regulation / Characterization 3

Parameters for basic characterization are also of fundamental importance



**Rheological properties**

**Particle size distribution**



**Water distribution**

# Institutional aspects

## Regulation / Characterization 4

**CEN** (European Standardization Committee)  
and

**ISO** (International Standardization Organization)  
are working on the development of standardized  
characterization and management procedures  
within, respectively, the

**Technical Committees**

**CEN/TC308** and **ISO/TC275**

specifically dedicated to sludge management



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I would have liked to be with you but yesterday's Prime Minister's Decree, valid for all Italy, does not allow me to leave my area of residence except to go to the supermarket or the pharmacy...

...and this without considering the disruption of air traffic from/to Italy.

Best wishes to all of us  
and see you next time