

# SWIM and Horizon 2020 Support Mechanism

Working for a Sustainable Mediterranean, Caring for our Future

## SWIM-H2020 SM Regional Activities 14

Presented by:

**MOHAMMD SUTARI, MEHSIP RESIDENT EXPERT-JORDAN**

**SWIM and Horizon 2020 SM REG-14: Refugee Emergency: Fast track project Design of wastewater**

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ENVIRONMENT AGENCY AUSTRIA **umweltbundesamt**

**ATKINS**

# FILTRATION & DISINFECTION



# Filtration & Disinfection

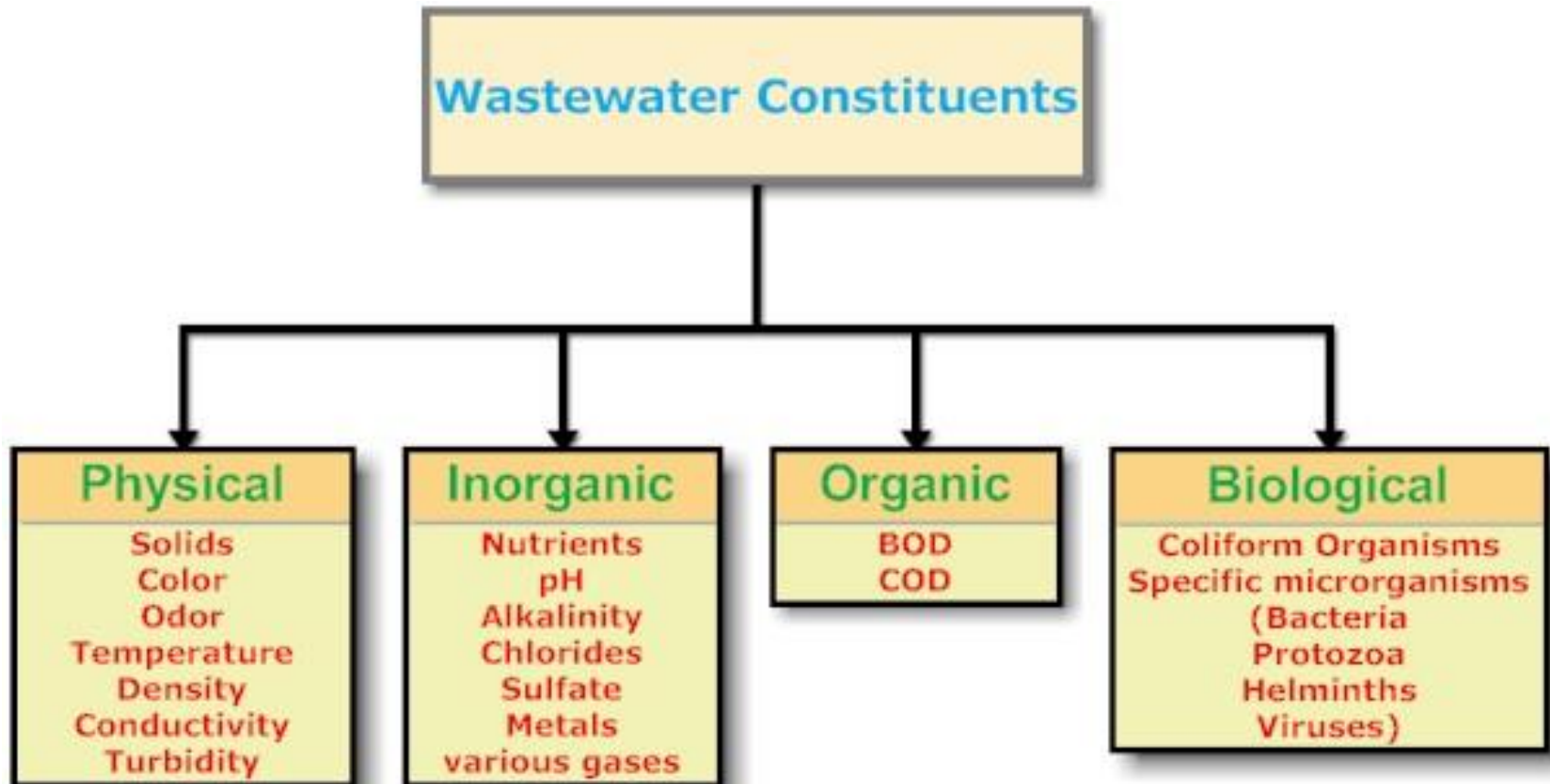
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# CONSTITUENTS IN WASTEWATER

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# DISINFECTION

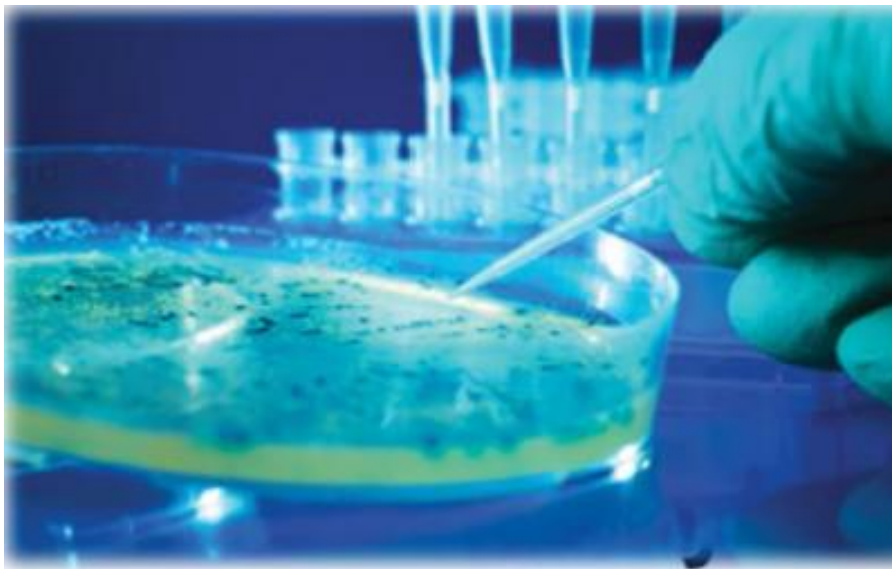
# TOTAL & FECAL COLIFORMS

## Total Coliforms

- Micro-organisms which may not be dangerous themselves, but whose existence may demonstrate a contamination with pathogens in the water.

## Fecal coliforms

- Existence confirms contamination
- Ecoli is part of fecal coliforms



# WHAT IS THE ISSUE ?

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- The issue is reducing the number of pathogens and indicator organisms in the discharge
- There are basically three alternatives:
  - Reduce them at the source
  - Physically remove them
  - Inactivate them so they cannot reproduce

# PHYSICAL REMOVAL

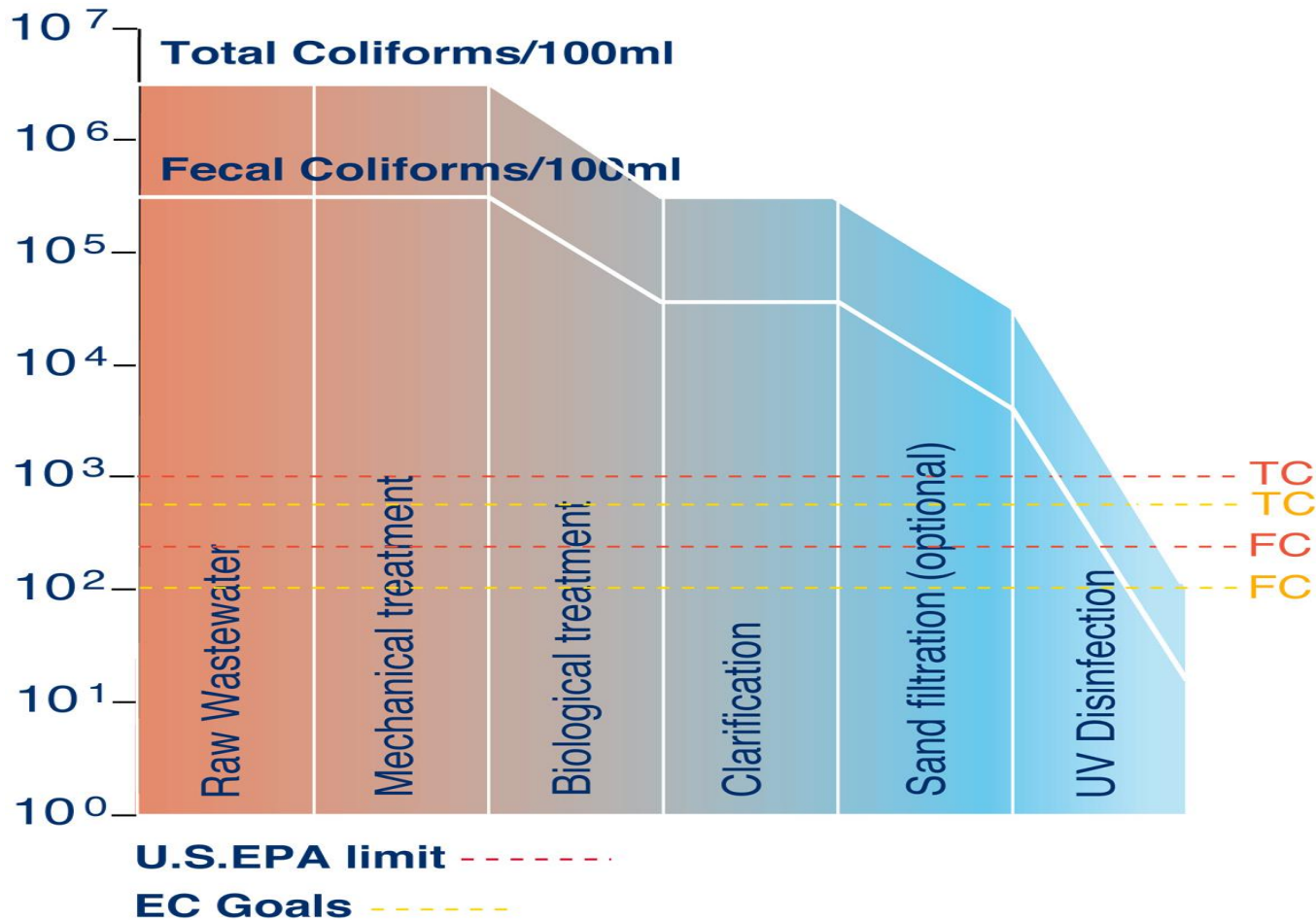
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<u>Process</u>	<u>Removal</u>
Screens	5-20%
Grit Chambers	10-25%
Primary Sedimentation	25-75%
Filtration	50-90%
Chem. Enhanced PS	40-80%
Microfiltration	99.9-99.9999%

**Only microfiltration gets the job done by physical means alone**



# TYPICAL WASTEWATER PROCESS



# INACTIVATION TO PREVENT REPRODUCTION

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- Processes that do this are commonly called “disinfection” processes
- Two Basic Choices:
  - Chemical Oxidants
    - Free or Combined Chlorine
    - Ozone
    - Chlorine Dioxide
  - Radiation
    - Ultraviolet light
    - Gamma radiation (risk of radiation leaks)
    - Electron beam (absorption - scale-up)