

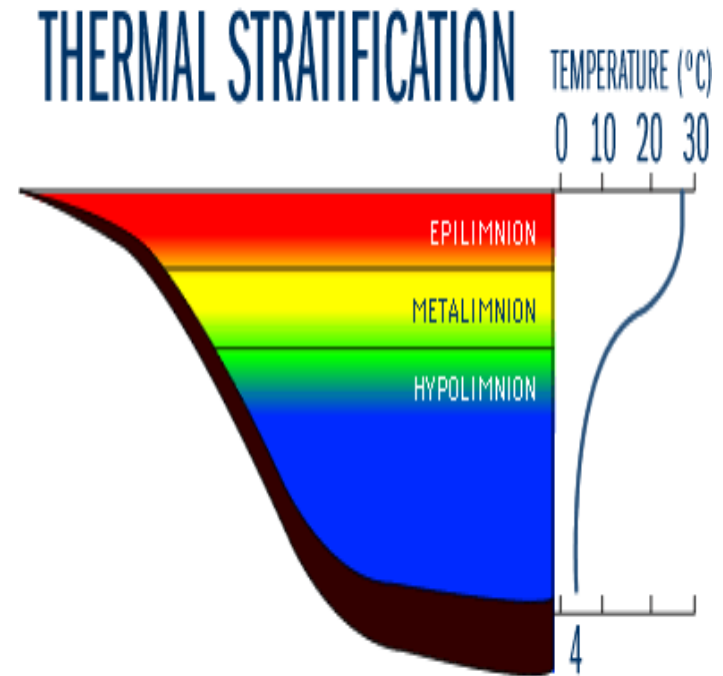
# Water Engineering Design

Reservoir-Intake Structure-Pumping  
Station- Aeration

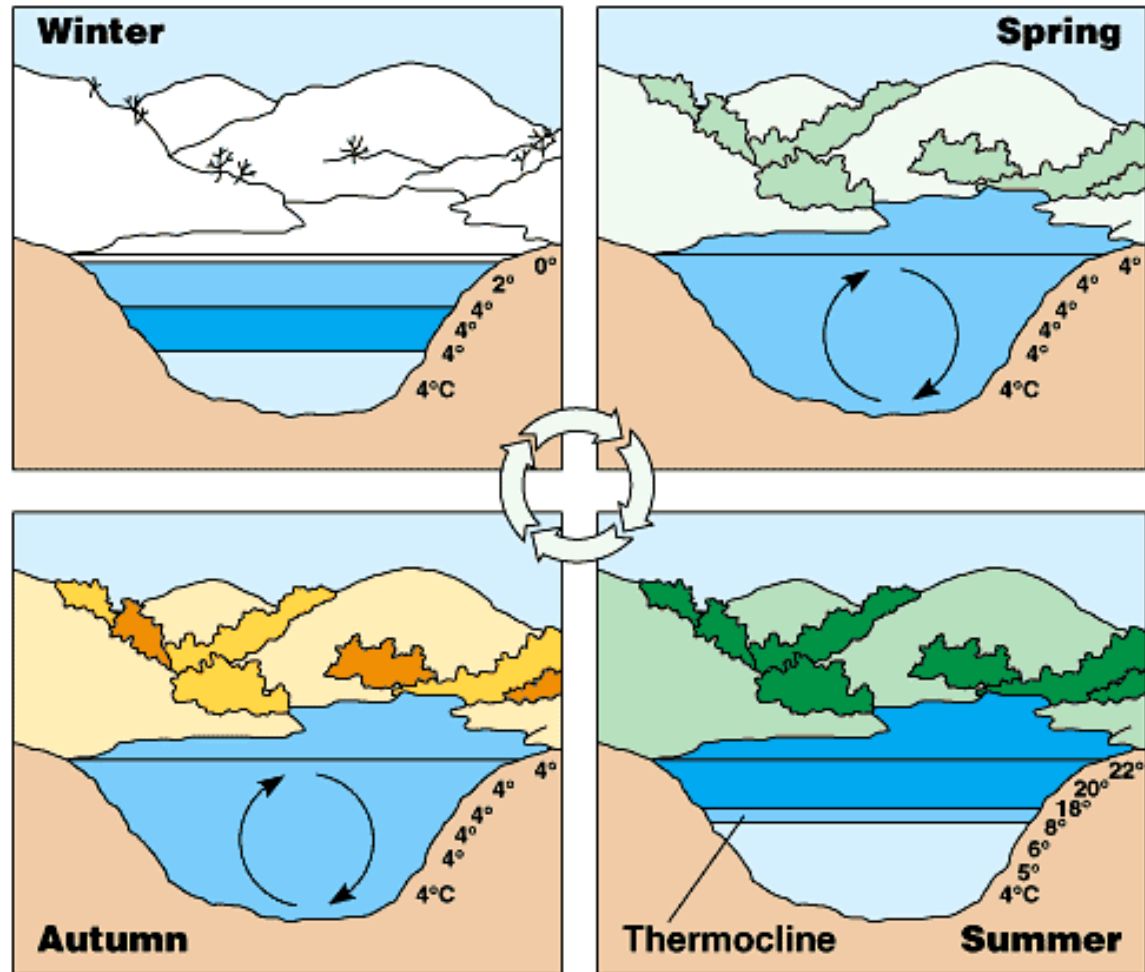
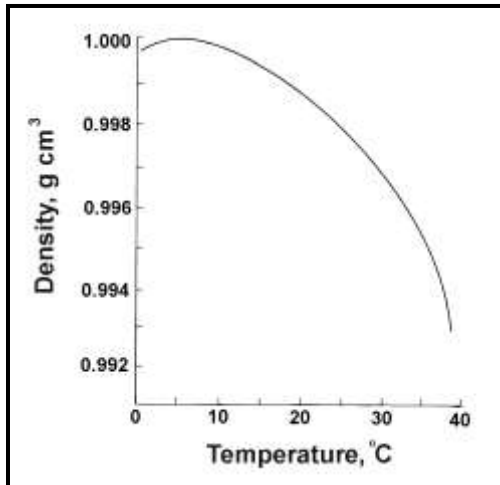
# Lake Stratification and Mixing

**Lake stratification** is the separation of lakes into three layers:

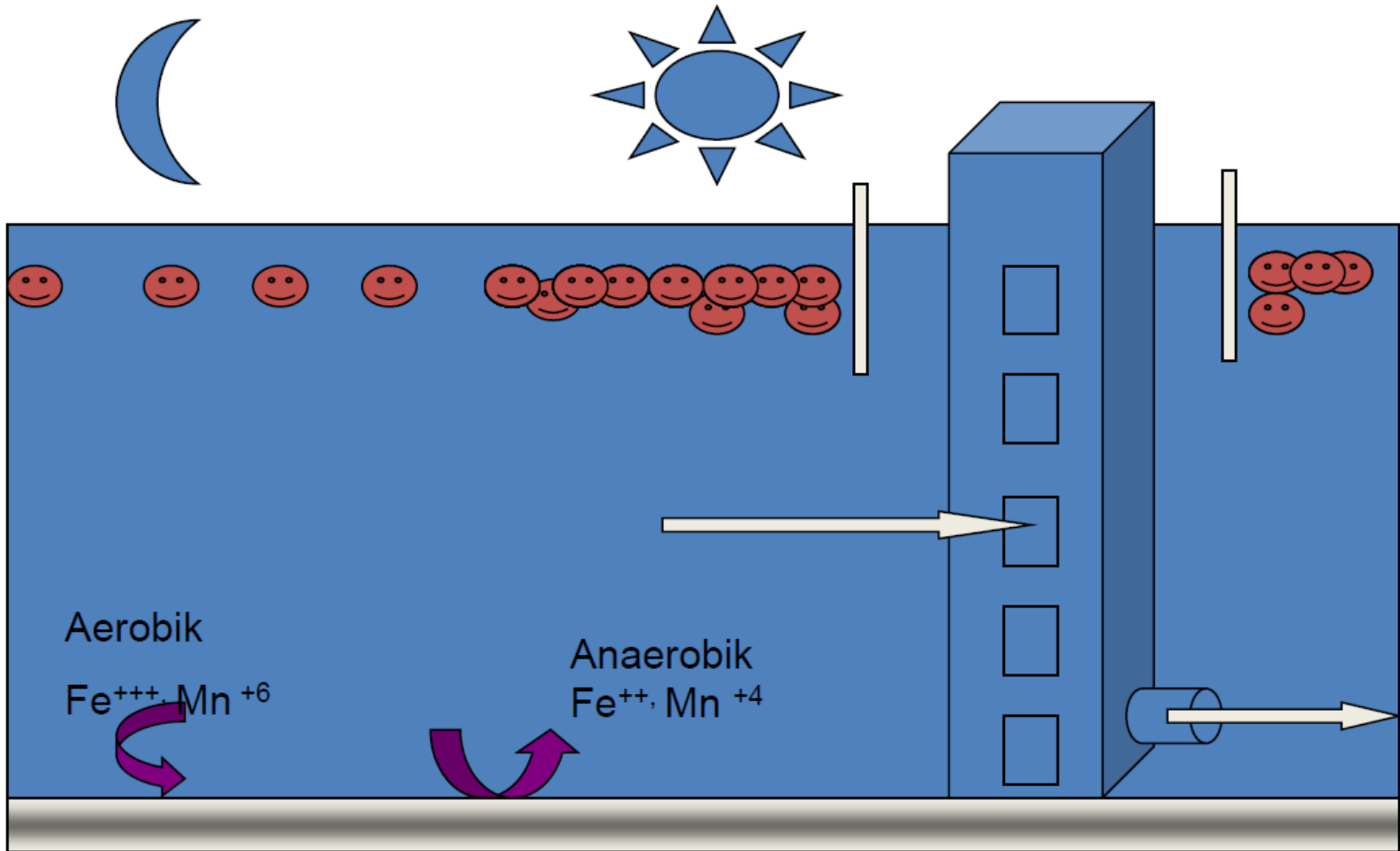
- Epilimnion
- Metalimnion (thermocline)
- Hypolimnion



# Lake Stratification and Mixing



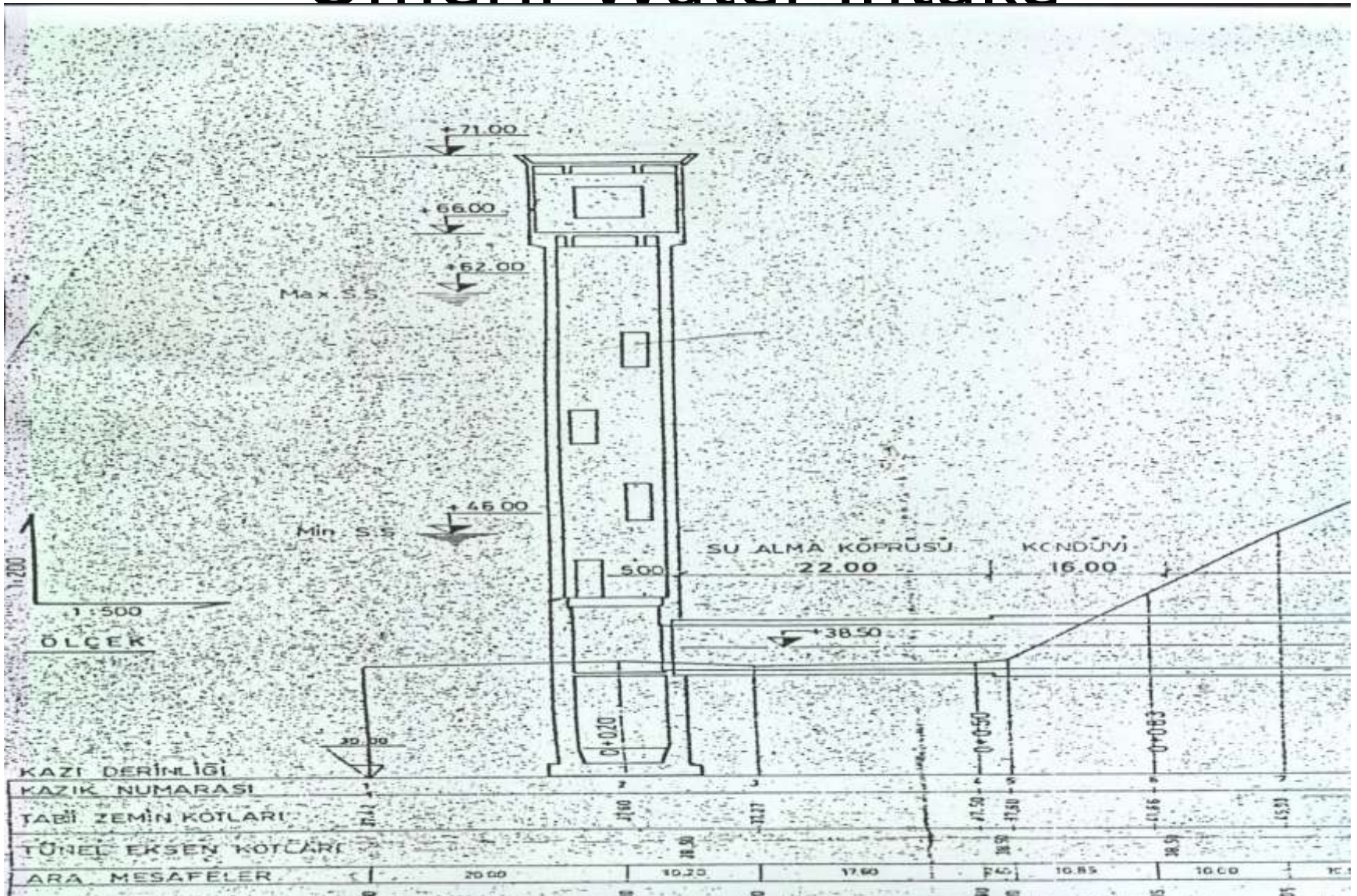
# Water Intake



# Water Intake

- Water Intake structure :
  - Selectively withdrawal of the best quality water
  - Excluding fish, floating debris, coarse sediment
- Desing Considerations
  - Intake Velocity
    - High V:increase headloss,entrain susp. solids, fish
    - Low V:require larger intake ports
  - Intake port location=>provide best quality water

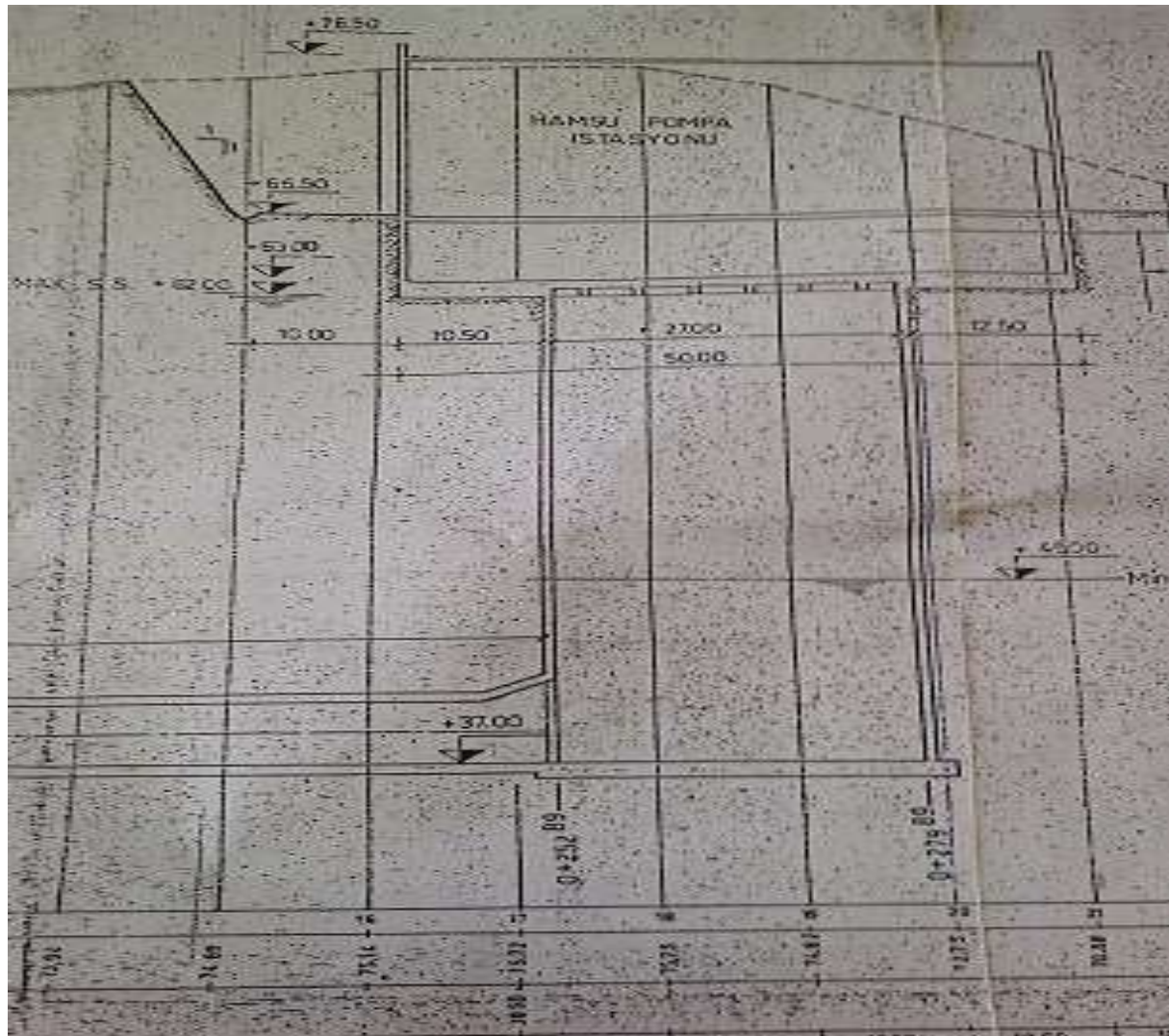
# Ömerli-Water Intake



# Stability Calculation

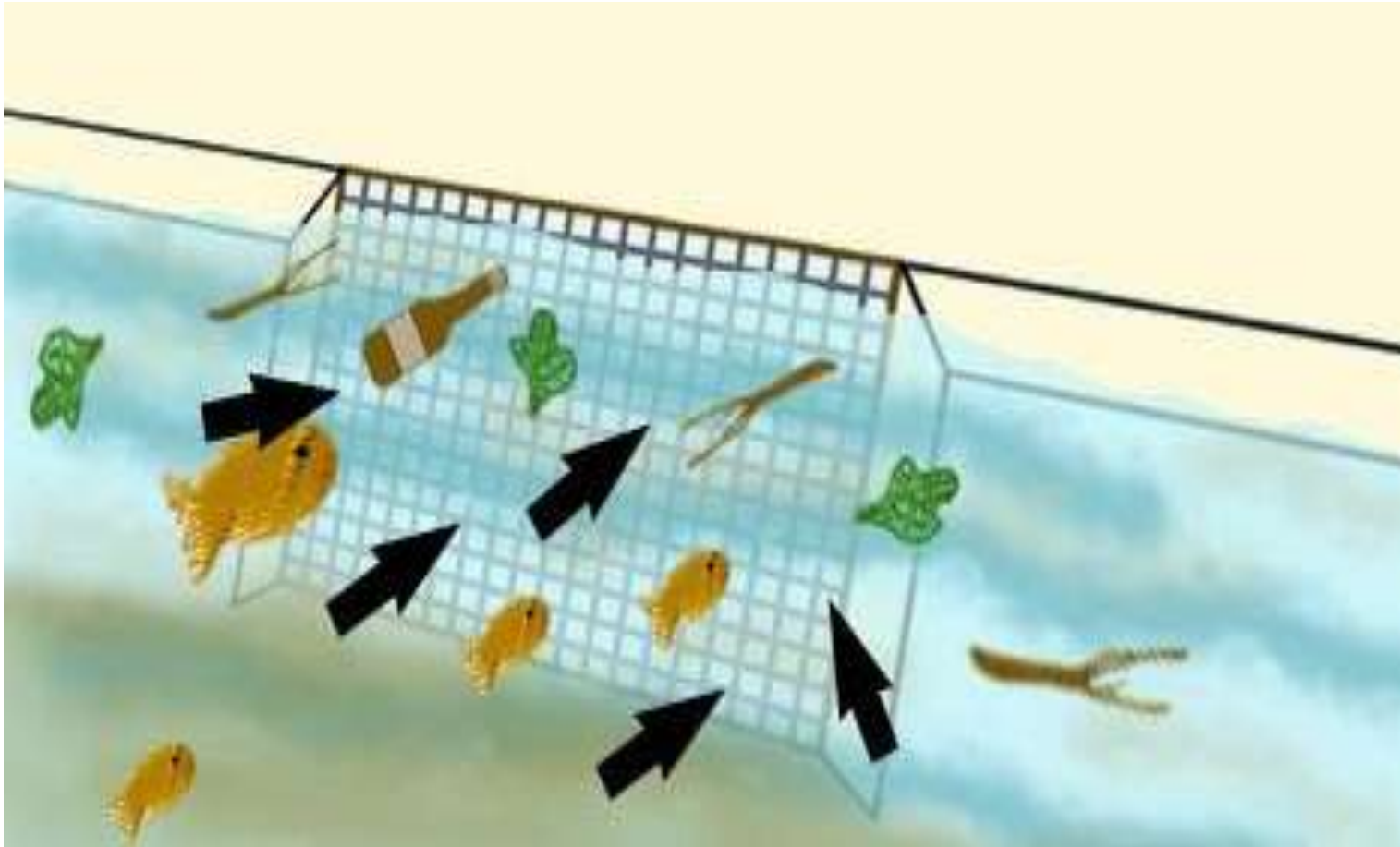
- The weight of the structure must be greater than the weight of water displaced
- Worst case:
  - tower is empty
  - Reservoir @ the highest elevation
- Safety Factor:
  - *total downward weight / Weight of water displaced*

# Ömerli-Water Pumping Station

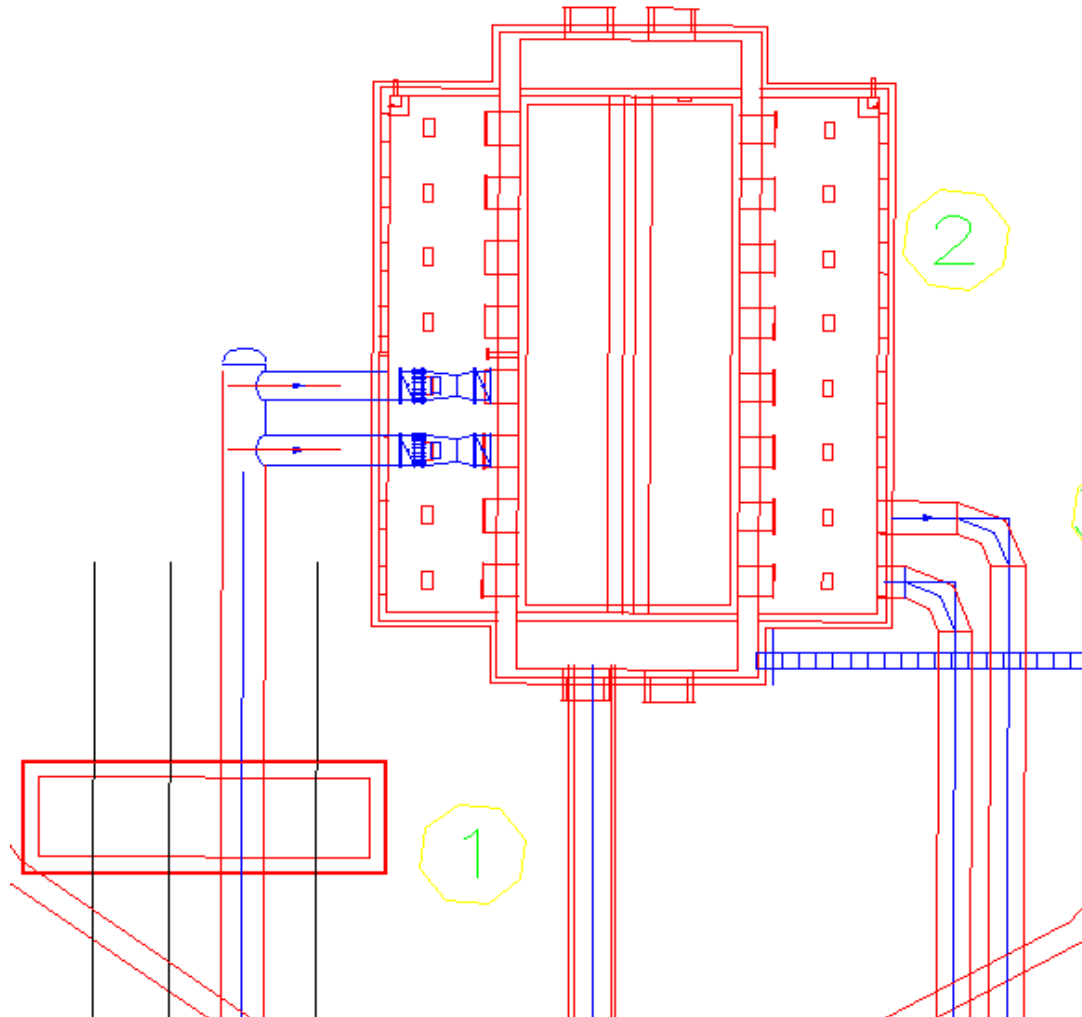




# Screens



# CUMHURIYET WTP- Splitter Chamber



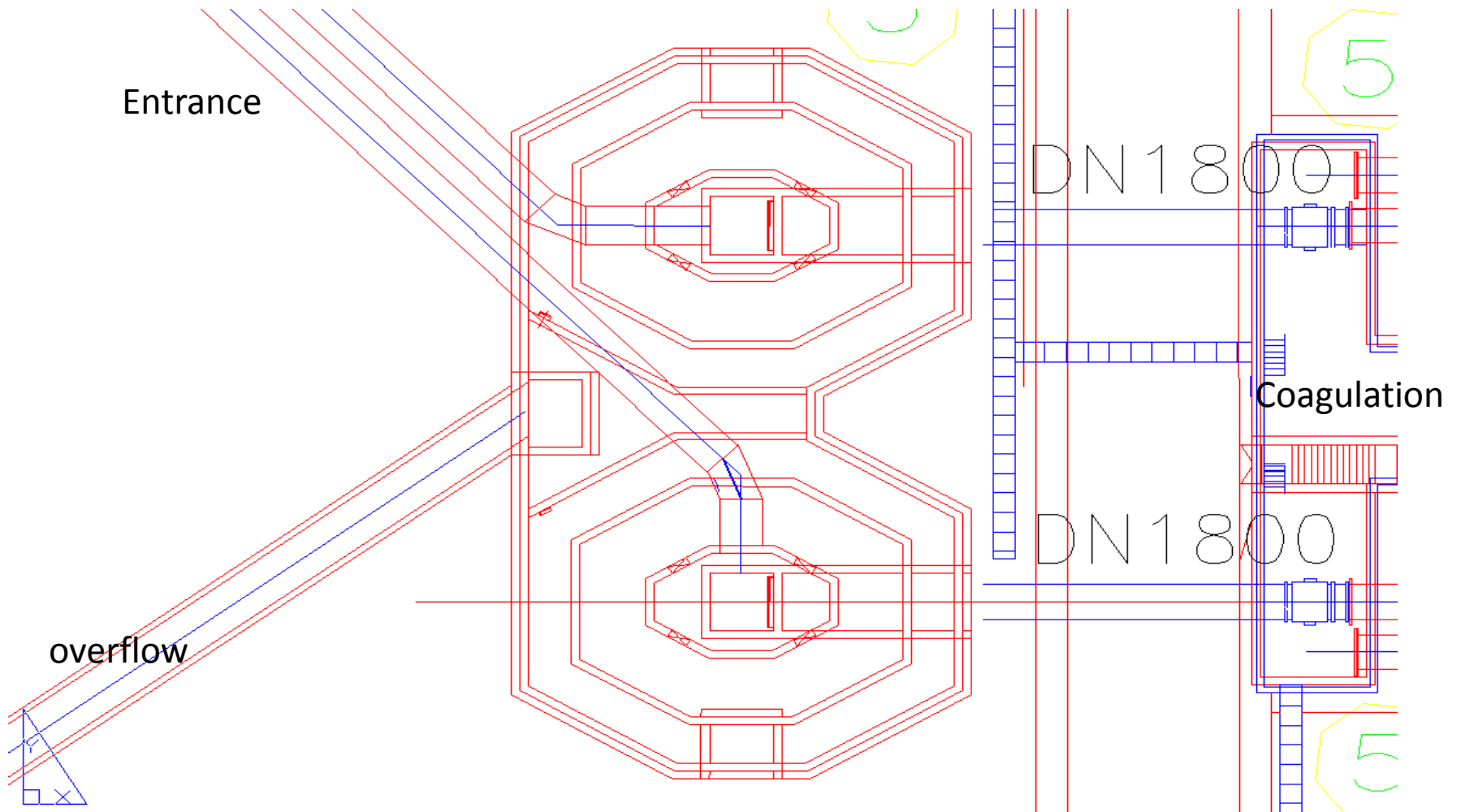
# Aim of Aeration:

- 1) increase the oxygen content
- 2) reduces the carbon dioxide content
- 3) remove methane, hydrogen sulfide and other volatile organic compounds responsible for taste and odor
- 4) oxidation of soluble Iron

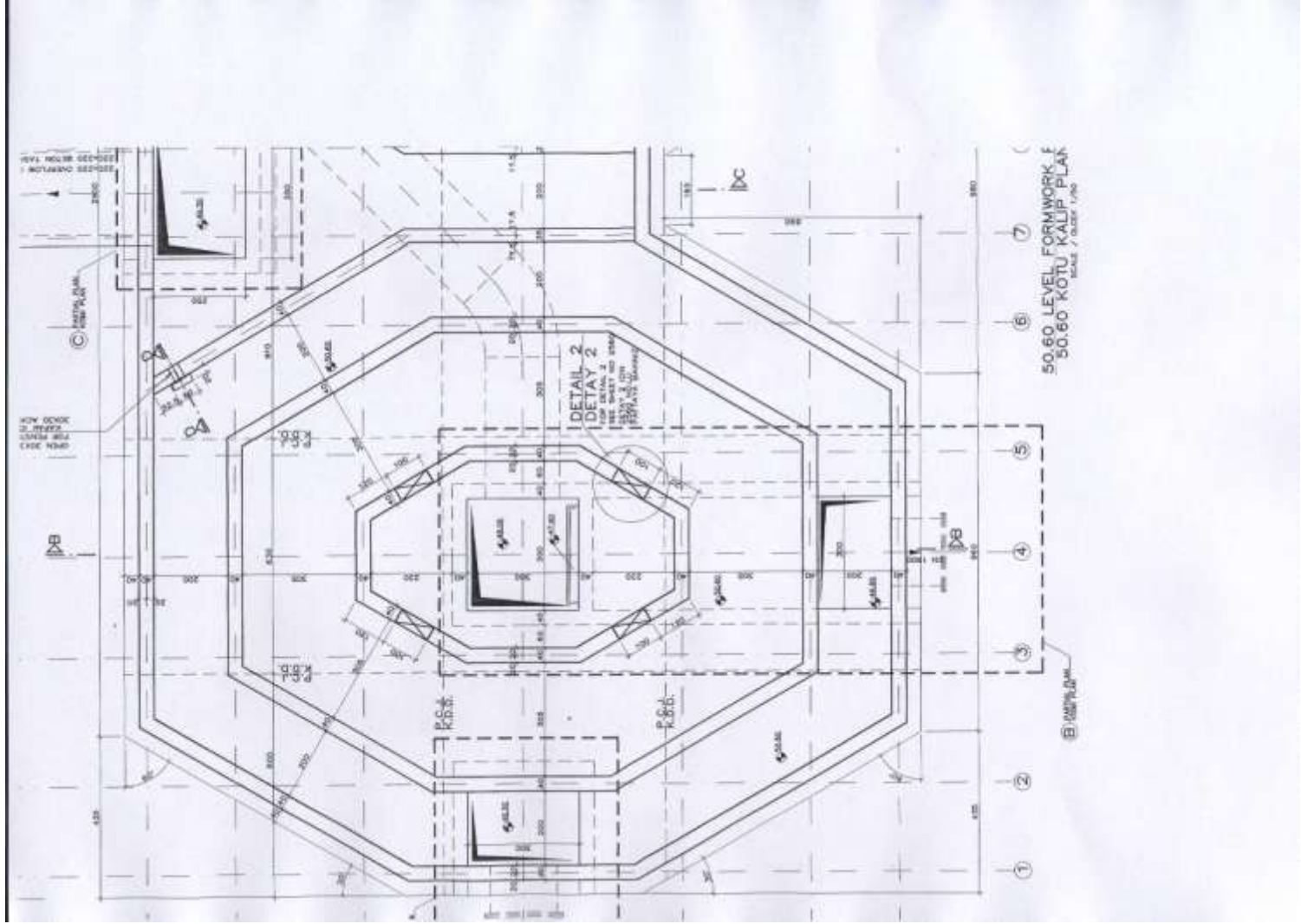
# Types of Aerators

- Gravity Aerators
  - Cascade aerator
  - Packing tower
  - Tray aerator
- Spray Aerators
- Diffused Aerators
- Mechanical Aerators

# CUMHURIYET WTP- Cascade Aeration



# CUMHURIYET WTP- Cascade Aeration



# CUMHURIYET WTP- Cascade Aeration

- # of steps :4
- Height of first step : 0,35 m
- Height of second step : 0,50 m
- Height of third step : 0,50 m
- Height of forth step : 0,40 m

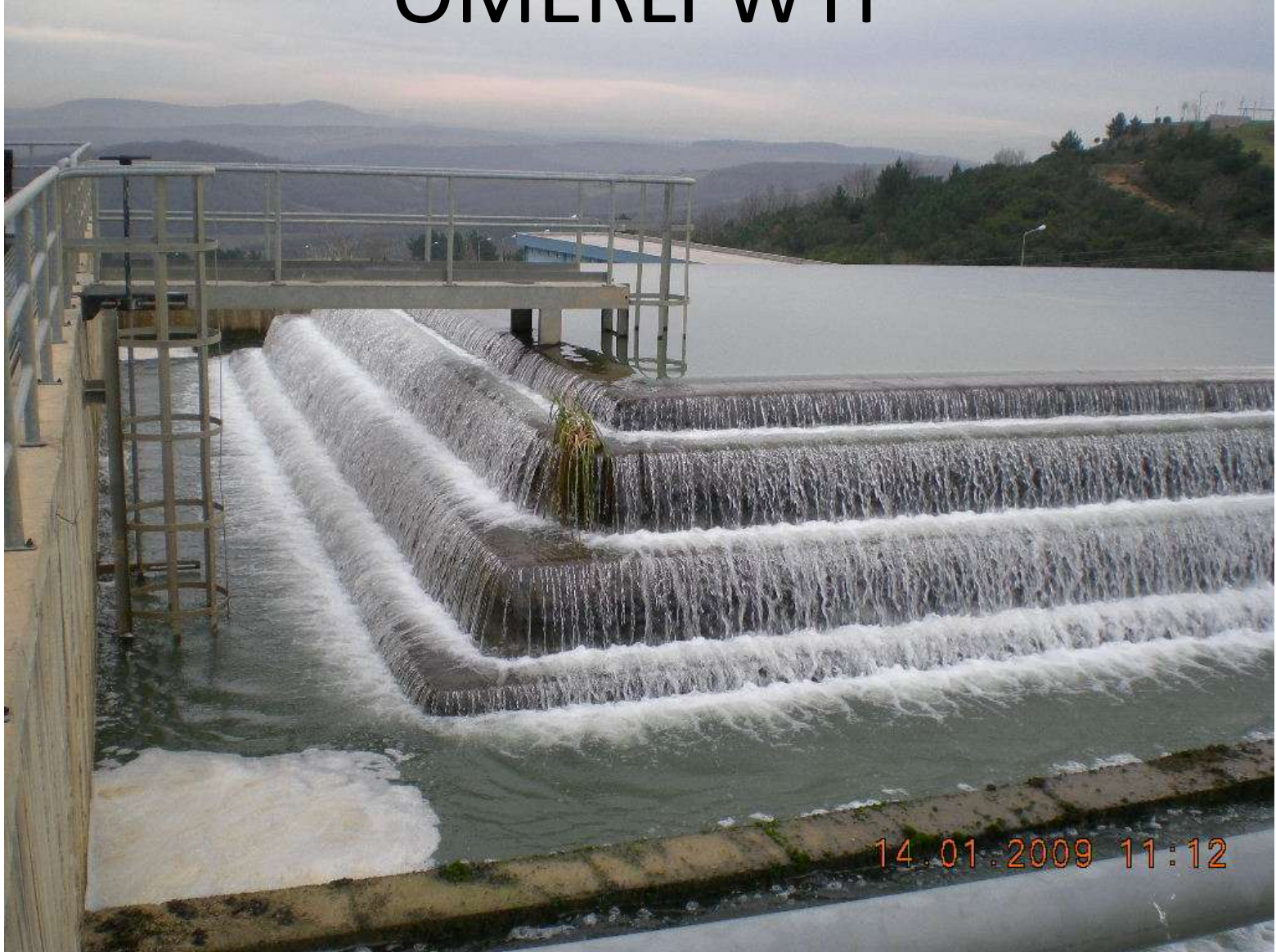
# Kırıkkale SAT – Cascade Aeration

**CLOSED TO ATM!!**





# ÖMERLİ WTP



# Ömerli WTP - Overflow Weir



# K. Hane WTP Cascade Aeration



