



**EUROPEAN COMMISSION  
EURO-MEDITERRANEAN PARTNERSHIP**

**Development of Tools and Guidelines for the  
Promotion of the Sustainable Urban Wastewater  
Treatment and Reuse in the Agricultural  
Production in the Mediterranean Countries**

**(MEDAWARE)**

**Task 6: Development of a Methodology and a Database for the Control  
and Monitoring of the Urban Wastewater Treatment Plants**

**Subtask 6.1: Development of a methodology for the dynamic control and  
monitoring of the wastewater treatment plants:**

**- Annex: Questionnaires: Operation of wastewater treatment plants**

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The questionnaires included in this Annex have been fulfilled by the representatives of different Wastewater Treatment Plants located in Mediterranean countries.

The information gathered in them has been analyzed and used for the preparation of the different reports on task 6.1.

The reports on task 6.1 make reference to the most common technologies/treatments applied in Municipal Wastewater Treatment Plants operating in the Mediterranean area.

These technologies/treatments have been selected after analyze the systems operating currently in the following treatment plants:

### **1 CYPRUS**

A specially designed fluidized bed of activated sludge (also called as pseudo-suspended activated sludge layer) where bioreactions and solids liquid separation (clarification) take place simultaneously, without the need of sedimentation process.

The WWTP consist of:

1. Grid Chamber
2. Skimmer Tank
3. Pumping Station
4. BioBlock Reactor (compact biological wastewater treatment). Activated sludge system + sludge stabilization + nitrogen removal
5. Flocculant dosing unit. Reduction of the phosphorous
6. Chlorination Tank
7. Sludge Storage Tank

Epuvalization system. Tertiary treatment which uses hydroponic cultures (ornamental plants, vegetables or grass).

### **2 JORDAN**

#### **2.1 Ramtha**

The WWTP consist of:

1. Screen
2. Wastewater Stabilization Ponds. Two anaerobic ponds, four facultative ponds, four maturation ponds
3. Chlorination unit

#### **2.2 Aqaba**

The WWTP consist of:

1. Screen

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2. Wastewater Stabilization Ponds: two anaerobic ponds, two facultative ponds, 20 evaporation/infiltration ponds
3. Chlorination unit

### **2.3 Wadi Mousa**

#### Preliminary Treatment

1. Parshall flume primary metering device
2. Mechanical bar screen
3. Grit channel
4. Odor Control Unit

#### Secondary Treatment

1. Biological reactor: “anoxic” zone + “oxic” zone
2. Secondary settling Activated sludge removed is returned to the biological reactor

Polishing Pond

Chlorine process

Sludge Holding Tanks – Drying Beds

Pumping Units + Lime System

### **2.4 Madaba**

The WWTP consist of:

1. Wastewater Stabilization Ponds. Anaerobic pond, facultative pond, polishing (maturation) pond
  2. Chlorination unit
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1. Screen & grit chamber
  2. Grease removal unit & equalization pond
  3. Biological treatment process: Anaerobic Tank + Anoxic Tank + Aerobic Tank
  4. Alum reaction unit for phosphorus removal
  5. Settling Tank
  6. Polishing & tertiary maturation pond
  7. Rock filtration
  8. Sludge treatment process: drying bed, deodorization unit

### **2.5 Mafraq**

The WWTP consist of:

1. Wastewater Stabilization Ponds: anaerobic pond, facultative pond, polishing (maturation) pond.
2. Chlorination unit

## **3 LEBANON**

### **3.1 Ain Harsha**

The WWTP consist of:

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1. Grease and Sand Trap
2. Bio-Digester. Anaerobic
3. Aeration Tank

### **3.2 Hebbariye**

Preliminary The WWTP consist of:

1. Coarse and fine screens
2. Anaerobic digesters UASB: i) sludge (sun drying/land); ii) CH<sub>4</sub>/CO<sub>2</sub> gas tank
3. Aeroic bacterial bed
4. Gravel filter (extra oxygenation)

## **4 MOROCCO**

The WWTP consist of:

1. Anaerobic pond
2. Equalization pond
3. Infiltration-percolation (sand filters)
4. Desnitrification
5. Reed beds

## **5 PALESTINE**

### **5.1 Gaza**

The WWTP consist of:

1. Sedimentation Ponds
2. Anaerobic pond
3. Trickling Filters
4. Aerobic pond
5. Settling channel + Polishing pond
6. Sludge Holding Pond + Drying beds
7. Chlorination (not in use)
8. Infiltration ponds

### **5.2 Al-Bieah/Ramallah**

(full automatic controlled)

The WWTP consist of:

1. 3 Screen unit
2. Grit chambers
3. Storm water overfalls - Balancing tank
4. Venturi flow measurement
5. Aeration tank (activated sludge system)
6. Sedimentation tank
7. UV-disinfection unit (not in use)

Sludge thickening tank + Sludge dewatering / pelt filter presses

### **5.3 New Centr4al**

The WWTP consist of:

1. Screening
2. Aerated grit and grease removal
3. Flow measurement
4. Primary settlement (stage 2)
5. Aeration tanks + Settlement tanks vs. SBR technology (aeration, anoxic and sedimentation intermittently in the same tank) ???

## **6 TURKEY**

### **6.1 IWSA**

The WWTP consist of:

1. Coarse screen, fine screen and aerated grit chamber
2. Biological Phosphorous Unit
3. 4 Aeration Tanks (anoxic, anoxic –summer-, 2 aerobic)
4. Secondary Sedimentation Tanks
5. Dissolved Air Flotation System (DAF) (bubbles attach to solids and float them to the surface where they are skimmed and removed from the tank)
6. Sludge storage tank + sludge drying unit

### **6.2 DUZCE**

The WWTP consist of:

1. Fine screen, open channel, grit chamber
2. Primary sedimentation tank
3. Trickling filter system
4. Secondary sedimentation tank
5. Sludge thickening tank + sludge digestion tank

### **6.3 AFYON**

The WWTP consist of:

1. Coarse screen, fine screen, grit chamber
2. Primary sedimentation tank
3. Trickling filter tanks
4. Secondary sedimentation tank
5. Sludge digestion tank + sludge drying beds