

# El Bodonal drinking water treatment plant

## IN SERVICE SINCE

- 1969

## BACKFITTING

- 1994
  - Modifications to the filtering system and the machine hall (pumping)
  - Reconditioning of the reagent dosing building, including the general automation of the facility
- 2007
  - Replacement of the use of chlorine gas by sodium hypochlorite and of ammonia gas by an ammonia solution

## FUTURE FACILITIES

- Granular activated carbon filters
- Ozone generation systems

## WATER SOURCE

- Lozoya river (El Atazar and El Villar reservoirs)
- Jarama river (El Vado reservoir)
- Sorbe river (Pozo de los Ramos well)
- Torrelaguna well field

## TREATMENT CAPACITY

- 4 m<sup>3</sup>/s

## WATER TREATMENT

### STAGES OF THE PROCESS

- Preoxidation-prechlorination
- Coagulation-flocculation
- Settling
- Fast sand filtering
- pH adjustment
- Disinfection

### REAGENTS USED

- Sodium hypochlorite for preoxidation and prechlorination
- Potassium permanganate for preoxidation
- Aluminium salts in the coagulation stage
- Flocculation aid in the flocculation stage
- Calcium hydroxide in the final pH adjustment stage
- Chloramines during the final disinfection stage

### RELEVANT TECHNICAL DATA

- Three settlers for fast sludge recirculation with a diameter of 46 m
- 20 filters with a unit surface of 100 m<sup>2</sup> for a total of 2,000 m<sup>2</sup>

### TREATED WATER TRANSPORT CHANNEL

- Lower channel



## SLUDGE TREATMENT

### TREATMENT CAPACITY

- 12,704 m<sup>3</sup>/day:
  - 10,000 m<sup>3</sup>/day from the filter washing
  - 2,704 m<sup>3</sup>/day from the settler blowdown

### STAGES OF THE PROCESS

- Thickening by means of gravity settling and flotation
- Mechanical dewatering (centrifuges)
- Storage in 80 m<sup>3</sup> silo

### RELEVANT TECHNICAL DATA

- Two lamellar settlers with dimensions of 14.60 x 4.50 x 4.50 m
- Two floats of 10.10 x 2.00 x 1.54 m with a unit capacity of 36 m<sup>3</sup>/h
- Two centrifuges capable of treating a maximum unit flow of 15 m<sup>3</sup>/h of sludge

### FINAL SLUDGE DRYNESS

- 15-20%

