



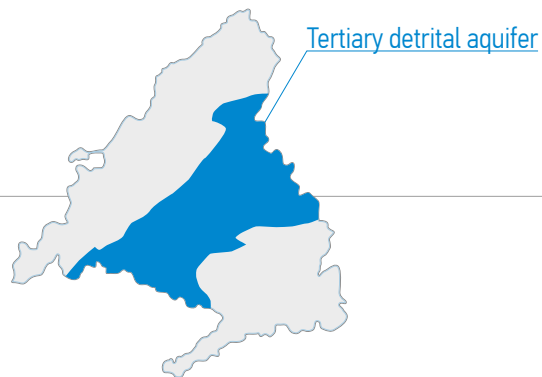
Tertiary detrital aquifer

The integrated water cycle • Water collection

Tertiary detrital aquifer

The incorporation of groundwater, Cretaceous carbonate and tertiary detrital aquifers, into the Community of Madrid supply system marked an important milestone in the management of water resources, as it makes a greater volume of water available to address demand during periods of drought, when the volume stored in surface reservoirs decreases. This makes their sustainable and more efficient use possible.

Lithologically it is comprised of alternating sands, silts and clayey sands contained within a mainly clayey matrix arising from the erosion of the mountains. These materials condition its hydraulic behaviour, which defines it as an aquitard.



Subterranean water body
**Manzanares, Jarama,
Guadarrama y Aldea del Fresno**

Extent of the outcrop

2,600 km²

Recharge capacity

120-150 hm³/year



Tertiary detrital aquifer

In general terms it is considered a single, heterogeneous and anisotropic aquifer. It is recharged by the interfluves of the Rivers Jarama, Manzanares and Guadarrama from rainwater. The download occurs both to the creeks and wetlands as well as to the major rivers in the region.

Despite its reduced porosity it stores several thousand cubic hectometres of water, giving it great importance as a resource.

However, not all this volume is usable for human supply, mainly due to the quality of the water below a certain depth.

The chemical composition of its water corresponds to the following flow chart: calcium bicarbonates in the interfluves and sodium bicarbonates in the discharge areas. In addition, the mineralisation increases with uptake depth, being relatively low in soundings of up to 500 m depth. Average conductivity is around 250-350 $\mu\text{s}/\text{cm}$.



Relevant technical data

Subterranean water body: Manzanares-Jarama, Guadarrama-Manzanares y Aldea del Fresno-Guadarrama (Madrid)

Extent of the outcrops: 2,600 km²

Recharge: 120-150 hm³/year

Thickness: 1,000-3,000 m

Useful thickness: 150-700 m

Horizontal permeability (K_H): 0.06-0.3 m/d

Vertical permeability (K_V): 0.03-0.15 m/d

Porosity (m): 0.6-3%

Storage coefficient (S): 10^{-3} - 10^{-4}

Specific capacity (Q_e): 0.2-1.5 l/s/m

Transmissivity (T): 40-150 m²/day



Watch a video about water collection

Canal 
de Isabel II