

# Bentofix® X

Water retention pond

Project name  
Water treatment plant in Niger

Project management  
Denys, Wondelgem, Belgium

Designer  
Denys, Wondelgem, Belgium

Product  
Bentofix® X2 BFG 5300





**Fig. 1: Installation of Bentofix® X**

## The use of geosynthetic clay liners help tackle the water crisis in Niger

Millions of people in sub-Saharan Africa have little or no reliable access to clean drinking water. Securing freshwater is a high priority in these regions.

The Bentofix® X geosynthetic clay liner (GCL), also known as bentonite mat, is used to seal reservoirs and storage basins, which are urgently needed for drinking water production. The use of this sealing system not only supports the extraction of clean water but also prevents any escape of sludge to the natural environment.

## Why Bentofix® X geosynthetic clay liners for water storage?

The Bentofix® X extrusion-coated geosynthetic clay liner (GCL, also known as bentonite mat) is a needle-punched barrier composite with an additionally firmly attached polyethylene barrier that fulfils the sealing function. Highly swellable sodium bentonite powder as primary barrier is encapsulated between two layers of durable and robust geotextiles: Needle-punched over the entire surface and thus erosion-stable. On the woven geotextile side, an impermeable and gas-tight polyethylene coating is firmly attached by extrusion. Together with the bentonite mat, it forms a multi-barrier system in Bentofix® X. There is a simple and safe sealing technique for the overlaps. Special sealing tapes are bonded to the coating of the overlapping bentonite mats.

Bentofix® is used to replace conventional clay liners. When in contact with freshwater, the bentonite quickly swells and creates a homogeneous, gel-like sealing layer, which has a sealing effect comparable to that of a 100cm thick clay liner. The PE-coating not only improves this sealing effect but also protects the bentonite against desiccation, root penetration or contact with critical chemicals. The cost-effective and quick installation of this multi-barrier sealing system results in a durable and low-permeability barrier.

The Goudel IV water treatment plant in Niger's capital city of Niamey converts grey water into safe, clean drinking water. Compliance with capacity requirements is essential, as the plant in Goudel covers 80% of the water consumption of the city of Niamey. The construction of three new tanks on the site will increase production by 30%.

Other focal points of the work were, constructing a fourth water treatment plant with a 40,000m<sup>3</sup>/day capacity and expanding the pumping capacity by 50,000m<sup>3</sup>/day.

International investments supported the latest construction phase.

More than 10,000m<sup>2</sup> of Bentofix® X and 1,680m of sealing tape for the necessary overlaps were installed to provide a long-term sealing system. The GCL was not the only geosynthetic material used; geocells were also installed on the slopes and backfilled with locally available sand to secure the stability of the soil cover.

The use of geosynthetics thus provided a safe and cost-effective freshwater supply to the region.



**Fig. 2: Placement of geocell over Bentofix® GCL**