The following example illustrates a project using a needlepunched geosynthetic clay liner (GCL) as a stand-alone sealing barrier for a retention dam built for Sainte-Marguerite hydroelectric dam.

The construction took place during the winter and a GCL was used due to lack of natural sealing material with a low hydraulic conductivity.

The Sainte-Marguerite dam (90 km north of Sept-Iles) is a structure built up to a height of 20 m (from the riverbed) of which the imperviousness is assured by a Bentofix® Geosynthetic Clay Liner (natural sodium bentonite sandwiched between two non-woven geotextiles and needlepunched together).

The cross-section of the dam is:

- Foundation made of a 20 cm thick layer of coarse sand compacted by means of explosives and dynamic compaction.

- Water tight trench with a maximum depth of 65 m, built by means of a “jet grout” high energy injection through 20 m compacted sand, 40 m coarse sediments lying underneath and 5 m into the rock

- Sealing with Bentofix®.

- A 1 m protection backfill in two layers, comprising sand, gravel and stones covers the Bentofix®.

Extract from Geoglobe No. 6, 1999
By Yousef Hammamji, ing., M.ing.
Hydro-Quebec Hydraulics and Geotechnical Division

Year of construction: 1999

City / Country: Sainte-Marguerite, Quebec, Canada

Installed products:
Bentofix® NW (B4000) 5,000 [sqm]