



**KAYTECH**  
ENGINEERED FABRICS

## Water Containment Dam Lining

Pienaar's River / Rust de Winter area, Limpopo

### Case Study

<b>Project:</b>	Dam on Game Farm, Elandsdraal 731, Pienaar's River / Rust de Winter area, Limpopo		
<b>Client / Consultant:</b>	Private owner	<b>Product:</b>	<b>EnviroFix<sup>®</sup> X800 Multi-Cell<sup>®</sup> 100</b>
<b>Date:</b>	March 2009	<b>Quantity:</b>	1 000 m <sup>2</sup> 140 m <sup>2</sup>

The owner of this new game farm was very keen to build a dam close to his house in order to attract more animals. There is a variety of game on the farm including ostriches, several buck species, zebra and giraffe. He originally requested a quote from contractors for the construction of his dam, but after much deliberation, he chose to build the dam with the help of his employees. Kaytech advised the owner to seal the dam using **EnviroFix<sup>®</sup>** geosynthetic clay liner (GCL) in conjunction with Kaytech's **Multi-Cell<sup>®</sup>**. The **Multi-Cell<sup>®</sup>** was to be installed around the edges of the dam for load distribution when game visited the dam. The GCL, in turn, would be utilised to line the dam and make it an impermeable structure.

Once the decision had been made to go with the proposal from Kaytech, the farm owner requested Kaytech to advise and do a check so as to ensure that the GCL was correctly installed. In order for the project to be completed successfully, appropriate equipment was hired for the project.

The construction of the dam followed the following basic steps:

- Construction started with clearance of the site and excavation.
- A 10 tonne roller compactor was used to compact the subgrade to > 90 % standard density, prior to installation of the GCL.
- On completion of compaction of the subgrade, the surface was inspected in order to ensure that there were no loose stones > 10 mm on the surface nor penetrating and/or protruding from the subgrade.
- An anchor trench was dug by hand by the farm labourers, to ensure proper anchoring of the GCL.
- The dam has a rectangular shape, 40 m long and 20 m wide. It would have caused minimum wastage if the length of the 40m roll was used. However, it is advisable that the **EnviroFix<sup>®</sup>** panels be deployed in the direction of the slope. End or transverse overlaps should be avoided. Therefore the choice was made to lay the GCL across the dam over the 20 metres width and do the necessary cutting and overlapping.
- The GCL was placed on the prepared surface with an overlap of 300mm along the longitudinal and end laps.
- The farmer planned to use a calcrete mix for cover-soil but he was advised by Kaytech that this practice is not advisable, due to the risk of cation exchange by the calcium contained in the calcretes.
- A cover soil of 300 mm was placed on the bottom of the dam and 500 mm on the slopes for extra protection, and, once placed, was then compacted.



By utilising Kaytech's products and installing the **EnviroFix<sup>®</sup>** himself, a cost saving of 75 % was achieved compared to the price originally quoted by the contractor (R120 000 compared to R480 000).

The dam was constructed in a relatively short time, and the farmer and his employees were impressed with the ease of installation as well as the quality and strength of the GCL.