



KAYTECH CASE STUDY

GEOMEMBRANE PROTECTION USING NONWOVEN GEOTEXTILE IN A CONTAINMENT FACILITY AT TUBATSE

GEOSYNTHETICS USED

bidim®: A continuous filament nonwoven needlepunched geotextile manufactured from polyester.

bidim® A8: Provides cushioning and puncture protection for HDPE liners in containment facilities, preventing damage from sharp aggregates and uneven subgrade.



CONTACT



Christiaan Van Wyk



083 265 7089



christiaanv@kaytech.co.za



www.kaytech.co.za



53 Harris Avenue, Sebenza,
Edenvale, Johannesburg

PROJECT DESCRIPTION

Containment facilities rely on geomembrane liners to prevent the release of contaminants into surrounding soil and groundwater. At the Tubatse HH facility, an HDPE liner was specified as the primary barrier for the containment system. While HDPE provides excellent chemical resistance and durability, it can be vulnerable to puncture from angular aggregates, construction equipment, or irregular subgrade conditions. A protective layer was therefore required to shield the liner from mechanical damage during installation and long-term operation.

A BETTER SOLUTION

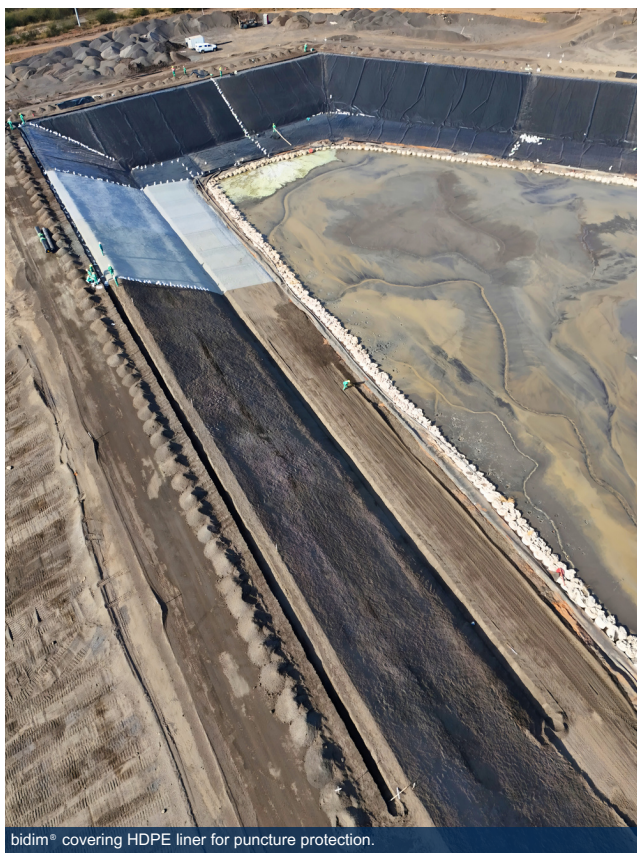
To safeguard the HDPE liner and ensure long-term containment performance, a protection geotextile layer was incorporated to manage mechanical stresses and mitigate puncture risk. bidim® A8, a high-strength, needlepunched nonwoven geotextile, was selected for its combination of thickness, tensile strength, and puncture resistance. These properties allow it to absorb point loads and distribute stress over a wider area, reducing the risk of damage from sharp objects, irregular subgrade surfaces, or angular aggregate placement.

Beyond puncture protection, the geotextile maintains separation between the liner and subgrade, preventing contamination that could impair the liner's chemical resistance or induce localised stress concentrations. During construction, bidim® A8 provides a cushioning interface, facilitating safe installation of the liner and reducing the likelihood of wrinkling or tearing. Over the operational lifespan, the geotextile continues to protect the liner from mechanical loads associated with inspection, maintenance traffic, or settlement of infill materials. By integrating this layer, the containment system achieves a robust, reliable performance, ensuring environmental protection and extending the functional lifespan of the facility.

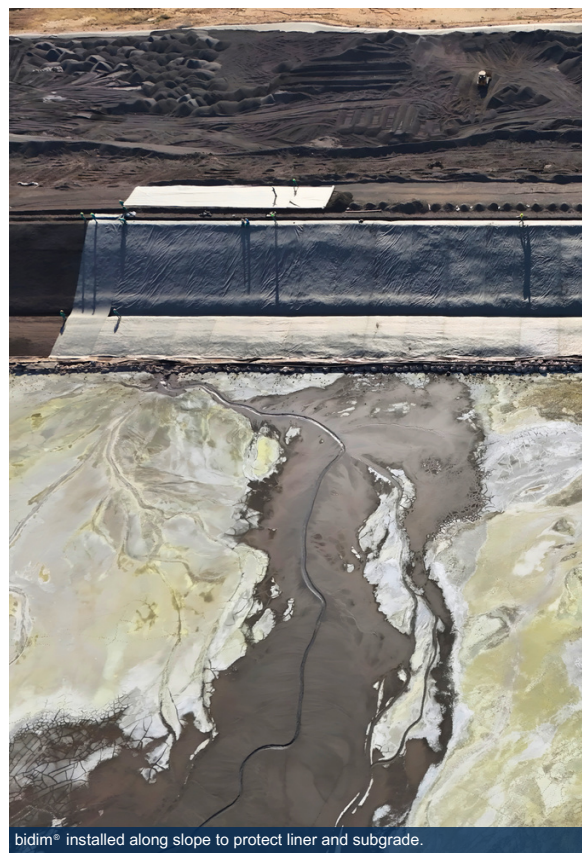
The inclusion of a geotextile protection layer improved the durability and reliability of the containment system at the Tubatse HH facility. By shielding the HDPE liner from potential puncture and mechanical damage, the bidim® A8 layer reduced the risk of liner failure during installation and long-term operation. This approach supports improved liner longevity and helps minimise the risk of costly environmental remediation associated with containment system failures.



Aerial view of containment cell showing bidim® on slope.

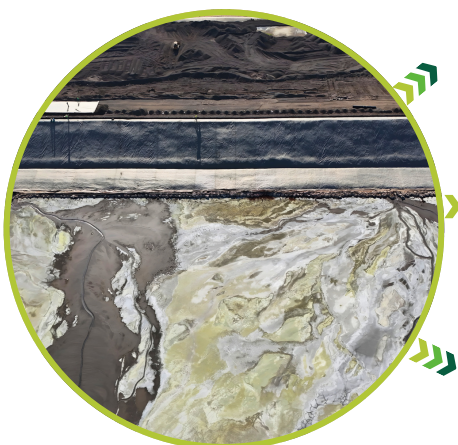


bidim® covering HDPE liner for puncture protection.



bidim® installed along slope to protect liner and subgrade.

Did you know?



Grade Selection Matters

Different bidim® grades provide varying thickness and strength; higher grades are best suited as protection layers for HDPE liners, while lighter grades serve primarily for separation and filtration.



Puncture Redistribution

Thicker geotextiles disperse concentrated loads from sharp aggregates or uneven subgrade, preventing localised damage to the HDPE liner.



Long-Term Protection

Using an appropriately graded geotextile ensures the HDPE liner maintains integrity over the facility's operational lifespan, reducing maintenance and environmental risk.