

TAILINGS STORAGE CLOSURE, NEW SOUTH WALES

MIRAFI PET reinforcement bridging soft coal fines



Industry:	Mining
Application:	Tailings storage facilities
Location:	Australia
Product:	MIRAFI® PET

The tailings surface has a crust thickness of 300 mm (11.8 in) - 500 mm (19.7 in). Beneath the crust, towards the center of each zone, the tailings are soft with undrained shear strengths of < 10 kPa (1.45 psi). This necessitates the use of geotextile reinforcement and light tracked equipment.

Overview

MIRAFI PET reinforcement geotextiles are widely used globally in civil ground improvement and the capping of tailings storage facilities (TSF) before placing cover material.

An example is the use of **MIRAFI** PET reinforcement to cap sections of soft coal tailings in a TSF impoundment in the Hunter Valley coal mining region, Australia. The areas to be capped consist of three sections with different coal tailings strengths.

Tailing dams store saturated mining by-products, resulting in a soft subgrade that poses challenges for construction machinery and personnel. Each of the three zones requires geotextiles with specific long-term design strengths (LTDS). Additionally, the materials supplied for each section need to be customized to cover the entire area to be capped.

Challenge

Zone 1 requires geotextile reinforcement with a long-term design strength (LTDS) of 145 kN/m (97.9 lb/ft). Zone 2, with a stiffer subgrade, needs geotextile reinforcement with an

MIRAFI PET reinforcement geotextiles offer customized solutions for challenging ground improvement projects, providing strength and stability without compromising on ease of installation.

CASE STUDY

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LTDS of 70 kN/m (47.5 lb/ft). Zone 3, the stiffest zone, requires geotextile reinforcement with an LTDS of 50 kN/m (33.9 lb/ft).

Three grades of **MIRAFI PET** - 200 kN/m (135.2 lb/ft), 300 kN/m (203.0 lb/ft), and 600 kN/m (406.1 lb/ft) - were approved for use. The geotextile reinforcement should be laid in two layers perpendicular to each other and anchored securely around the edges. The rolls are supplied in various lengths based on the contractor's detailed layout plan.

Zone 2, the largest zone, was the first to be capped using **MIRAFI PET 300** in lengths ranging from 130 m (426.5 ft) - 200 m (656.2 ft). **MIRAFI PET 600** was then installed over Zone 1, the softest zone. Finally, **MIRAFI PET 200** was installed over Zone 3, the firmest zone.

Solution

All materials supplied for the project underwent testing and certification according to the design requirements. Each roll was marked to indicate the zone and layout section for correct placement on-site. Deployment over the soft tailings was done using a light tracked Bobcat with a laydown dispenser for easy unrolling.

After installation, the **MIRAFI PET** reinforcement was covered with an initial 400 mm (15.7 in) layer of mixed spoil, progressively laid as finger berms that extended toward the center of each zone. These berms were then infilled. This method tensions the geotextile and speeds up closure of the unfilled areas between the finger berms. Once capped, the layers of mixed spoil will be covered with site dumped rock to a final level suitable for natural vegetation growth.

Performance

Each soft site closure presents unique challenges, as seen in this project with three different zones requiring specific solutions. Typically, these projects involve large areas with soft and unstable subgrades, sometimes even underwater.

Can provide compliant geotextiles in custom lengths that cover the entire area without seaming. Specially fabricated fabric panels can also be used across large areas in a single pull.



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