MINE REHABILITATION SOLUTIONS

GEOFABRICS®

Sustainable solutions

Protection
is becoming a critical part of a mine's
Social License
obligations

Why use geosynthetic engineering in mine rehabilitation?

Geosynthetic engineering can assist with repairing and restoring the landscape during or following the conclusion of mine activity. From flattening or securing steep slopes, to waste containment, revegetation and the protection of waterways, geosynthetics can be used to support safe, stable and non-polluting rehabilitation for future use.

We work with our clients to develop rehabilitation and containment systems which are backed by years of research and are designed to meet regulatory guidelines, are in-line with the Mining Act 1992, and mitigate risk.

BENEFITS FOR MINERS

ECONOMIC

The fundamental benefit of using geosynthetics in mine rehabilitation projects is to save costs by mitigating risk, reducing maintenance and by reducing high volumes of fill materials, such as tailings capping layers, sand protection layers and gravel drainage layers.

TECHNICAL

Geosynthetic design can remove the risk of variability in traditional lining, capping, dewatering and drainage systems. The consistency of product, predictability of performance and ability to provide long-term performance data in extreme conditions reduces risk.

ENVIRONMENTAL

Geosynthetic lining systems are equivalent or superior to traditional soil and clay containment of waste and contaminants. Ensuring sound containment protects waterways, fish, animals and the surrounding environment from contaminants. By reducing volumes of fill material required, there is less need to quarry and fewer machines required in construction, reducing the carbon footprint. Geotube dewatering technology also significantly reduces the volume of waste for disposal, reduces risk of wet Tailings Storage Facility (TSF) failures and allows for recycling of water.

SAFETY

Geosynthetics are utilised in mine rehabilitation to secure unstable, steep slopes; manage mine waste; protect water sources, and ensure land is safe to use for landholders, communities or traditional owners.

GOVERNANCE

Through our dedication to technical excellence, Geofabrics can demonstrate the use of geosynthetics to achieve site legal environmental obligations. Our GRID (Geosynthetic Research, Innovation & Development) laboratory can provide transparency to mining companies who are governed to achieve best practice.

TAILINGS & WATER MANAGEMENT

- Contain waste to protect surrounding environment and ground water from contamination
- Protect lining systems to maintain performance of waste storages and reduce leakage
- Detains tailings and waste for treatment through evaporation or dewatering to reduce waste

CAPPING SYSTEMS

- Increase bearing capacity of low strength mine waste with geotextile reinforcement layer
- Allow for re-use of land following rehabilitation
- Minimise impact on the environment

EMBANKMENT & SLOPE REINFORCEMENT

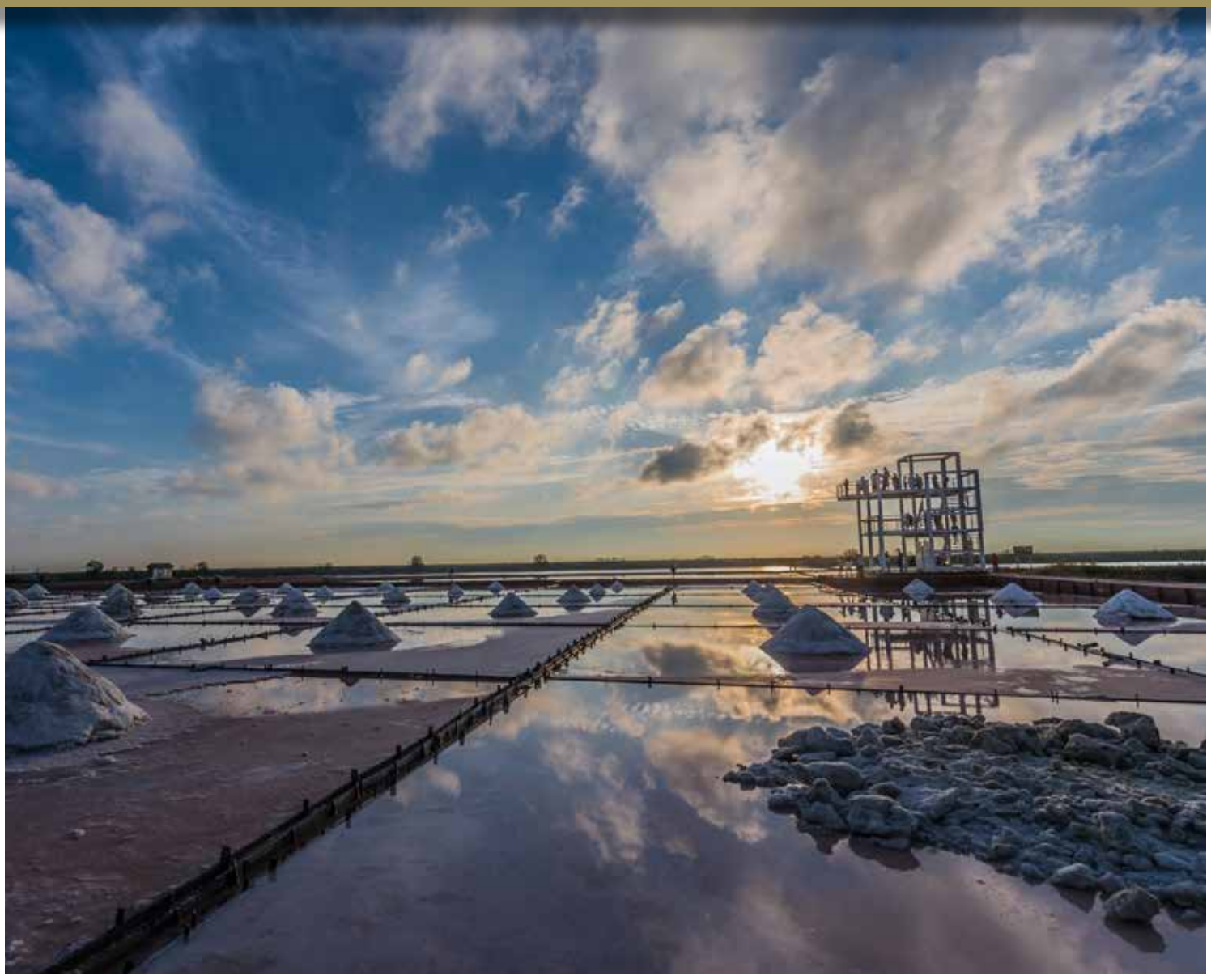
- Secure steep slopes and unstable rock faces
- Provide safe working environment and stable land form
- Maximise the performance of on-site material or fill

EROSION CONTROL & SITE REHABILITATION

- Prevent erosion to reduce run-off into waterways
- Encourage revegetation to protect slopes from degradation
- Encourage revegetation and return to natural environment
- Minimise maintenance of erodible slopes

TO HELP REHABILITATE MINE AREAS INTO SAFE AND STABLE ENVIRONMENTS

WORKING WITH CLIENTS TO DEVELOP THE RIGHT GEOSYNTHETIC SOLUTION FOR EACH PROJECT



Who are Geofabrics?

Geofabrics are the only Australian manufacturer of geosynthetic products, with plants in Albury, New South Wales and Ormeau, Queensland.

Our success is based on strong partnerships with clients to solve their engineering problems. Our vision is to be a solution provider, to supply products that demonstrate cost savings, superior technical performance, safer operations and better environmental outcomes.

Technical leadership

GEOFABRICS GRID LABORATORY

We supply world-class technical leadership and engineering support through our innovation, research, industry education, design and independent testing services.

Our GRID (Geosynthetic Research, Innovation & Development) laboratory is a specialist facility that works with clients to develop the right geosynthetic solution for each project.

Based in south east Queensland, the laboratory houses a selection of key geosynthetic-specific test equipment. Testing is aimed at solving the real-world problems that designers, contractors and asset owners find on their site – to ensure the right solution is adopted.

- Analysis is performed according to Australian and International test methods
- Comprehensive test reports are generated, including results, photos, graphs, test conditions and details of the apparatus used
- Research is supported by industry leading suppliers in both laboratory and field trials across America, Europe and Asia

MINING DESIGN & INNOVATION HUB

Geofabrics Mining Design and Innovation Hub can provide our clients with specification reviews, design suggestions and certified designs for geosynthetic applications. We employ engineers who can review historic mining process and provide innovative solutions that are more cost effective and technically superior.

We can provide a range of options for all aspects of mine rehabilitation.

INNOVATION & EDUCATION

We provide technical and practical education to engineers about the use of geosynthetics in a range of infrastructure projects.

Our team conducts real-world, technical seminars for engineers and contractors to earn CPD hours through our Geofabrics Academy. We also run in-house workshops for our clients and undertake lectures at universities around Australia and in New Zealand.

We are proud to support the next generation of engineers through sponsorship of PhD candidates.

QUALITY & TRACEABILITY

Geofabrics manufactures in compliance with the Australian and International Quality Standards and are ISO 9001 assured. We operate two QA laboratories in Australia – Albury is NATA accredited, Ormeau GRID is GAI LAP accredited and products are tested frequently and transparently.

SUSTAINABILITY

We work to protect, contain and secure the physical environment using smart geotextile and geosynthetic products. We help our clients mitigate environmental risk through world leading research and innovative product development.

Geofabrics is a proud member of the Infrastructure Sustainability Council (ISC).

SITE INSTALLATION

Geofabrics has the largest regional footprint of any geosynthetic supplier in Australasia. We have branches in key mining regions, so we can deliver product where and when you need it and provide local expertise to support your project.

Product installation is critical to project success, local representation can ensure correct procedures and minimal delays.

Geofabrics Centre for GEOSYNTHETIC RESEARCH, INNOVATION & DEVELOPMENT

GEOFABRICS ACADEMY

bsi. ISO 9001 Quality Management

Infrastructure Sustainability Council MEMBER

35+

Years of reliable supply

GEOFABRICS


TAILINGS CAPPING
MIRAFI PET
SLOPE PROTECTION
BIOMAC COCONUT FIBRE
GEONET
SORBSEAL
HDPE
BIDIM C
FLOWNET
TERANAP BGM
TAILINGS
CONTAINMENT
GEOTUBE
DEWATERING
JUTE MAT
REVEGETATION
GRASSROOTS
MIRAFI RSI
GEOTEXTILE
UNSEALED
HAUL ROADS
TRIAXIAL GEOGRID
BIDIM
GREEN


MINE LANDFILL AREA
DAM LINING
BIDIM
ELCOSEAL GCL
REINFORCEMENT
PARAGRID
TERRAMESH
GEOWEB
GEOFABRICS

Waste management

Reduces
aggregate usage

Geosynthetic engineering in mine rehabilitation can achieve a cost benefit and improved environmental performance when compared to traditional engineering techniques.

Waste
volume
reduction
as high as
90%
with Geotube

TAILINGS & WATER MANAGEMENT

The design aim is to contain and collect tailings through engineered geosynthetic lining systems.

Utilising TenCate Geotube containers is an effective alternative to mechanical processing that enables the capture of precious metals and the efficient management of mine tailings, coal sludge, and other mine waste streams. With volume reduction as high as 90%, high solids levels make removal and disposal easy.

The Geofabrics GRID laboratory presents a key partnership opportunity for mine sites who have legacy contaminant streams that cannot be processed. Emerging passive tailings treatment solutions present as key technologies to treat AMD Water, high pH and brine solutions. The fundamental technique uses a contained treatment system to treat contaminated waters that polishes the water for release into the environment or process re-use.

- Lining system at base separates waste from subgrade soils and protects ground water from contamination
- Teranap BGM has excellent resistance to ageing due to the elastomeric bitumen compound enabling the material to retain its elasticity for extensive periods
- Sorbseal works as a barrier to liquids in the same way as a regular GCL, but also helps trap a wide range of contaminants, including potentially dangerous PFAS chemicals, commonly found in fire fighting foams and non-stick resistant chemicals
- Cushion geotextiles, including Bidim provide liner protection at a fraction of the cost of a sand protection layer
- Geotube is a cost-effective dewatering system that uses high strength geotextiles with unique filtration and solids retention properties
- Dewatering of wastewater and sludge is commonly achieved by pumping the slurry into permeable geotextile tubes; treating with site specific flocculants; and allowing the moisture to both evaporate and drain through the geotextile pores under low pressure
- The run-off from the dewatering process can be reused or treated and returned to native waterways while the sediment or waste can be reprocessed or detained

CAPPING SYSTEMS

Once a waste storage facility has reached capacity, environmental concerns may necessitate the capping and sealing of the storage dam. Typical concerns include site access and reuse, rainfall infiltration, stability and gas emissions. Geofabrics has design strategies that enable the use of high strength geotextiles or geogrids to enable tailings cap access and create a working platform that can be trafficked. Unlike civil engineering, the liquor chemistry must be considered in terms of the solution, as geosynthetic stress-strain behaviour will change if the polymer is impacted by acid or high pH environments.

The desired end use governs the design of a suitable system which may include a number of geosynthetic products. Sealing of the facility can be achieved by capping the waste with a suitable geosynthetic clay liner (GCL) or composite lining system. This will prevent ingress of water, gas emissions and contain the waste.

Vertical wick drains inserted into the tailings can be used in conjunction with capping systems to improve TSF settlement periods and speed up closure of mines, by promoting and allowing free passage of tailings leachate to the surface. Less water remaining with the TSF means a safer and more stable asset.

RECOMMENDED TAILINGS & WATER MANAGEMENT PRODUCTS

Bidim® Green Non-Woven Geotextile
Bidim® Non-Woven Geotextile
Flownet® Drainage Geocomposite
Flownet® Biplanar Drainage Geonet
Teranap Bituminous Geomembrane
TenCate Geotube®

RECOMMENDED LINING & CAPPING PRODUCTS

TenCate Mirafi PET
Elcoseal® GCL
Sorbseal® hGCL
Wick Drains

RESPONSIBLE MINE MANAGEMENT STARTS WITH THE BEST CONTAINMENT

GEOSYNTHETIC SOLUTIONS THAT ENSURE SAFETY AND ENABLE SITE REHABILITATION

Embankment & slope reinforcement

Rainfall erosion can cause major damage to tailings and waste embankments and cause loss of final landform profiles. Geofabrics has a range of surface erosion solutions that protect the land, prevent high velocity sediment movements, and enable revegetation.

Geosynthetics can be used to reinforce embankments and steepen slopes constructed from site won material. Maccaferri Paralink, Paragrid and Terramesh systems permit construction of soil slopes up to 70° using a geotextile or mesh face without the need for a full height wall system.

- Maccaferri Terramesh reinforced soil structures provide long-term stability, proven longevity, simplicity, cost effectiveness and rapid construction
- Ground stabilisation solutions reduce volumes of imported fill and improve the engineering performance of site soils available for construction

Enables soil slope construction of up to

70°

Erosion control & site rehabilitation

Geosynthetic erosion measures can be deployed rapidly to prevent loss of surface sediments and organic deterioration of soils. Long-term, the fabric provides a matrix to retain seed and soil and improve the shear resistance of future revegetation.

- The selection of natural and/or synthetic materials depends on the topography, hydraulic conditions and required longevity
- Jute Mat is a robust weed and erosion control geotextile made of natural jute fibres
- Grassroots is a tight weave synthetic erosion control mat designed to retain maximum sediments while encouraging revegetation
- Able to withstand high velocity water flows both during seeding and sediment control

Fully biodegradable erosion control options

RECOMMENDED EMBANKMENT & SLOPE REINFORCEMENT PRODUCTS

Maccaferri® Paralink
Maccaferri® Paragrid
Maccaferri® Green Terramesh® Wire Mesh
Maccaferri® Terramesh® Reinforced Soil Wall Wire Mesh

RECOMMENDED EROSION CONTROL PRODUCTS

Grassroots® Synthetic Erosion Control Mat
Biomac Coconut Fibre
Jute Biodegradable Erosion Control Mat

GEOFABRICS®

Geofabrics is the only geotextile manufacturer in Australia, with plants in Albury and Ormeau. We pride ourselves on providing unrivalled service to our customers. We can recommend the best geosynthetic product to achieve the objectives of your project and ensure it's available when you need it.

Over 40 years of experience allows our technical staff to provide practical support, based on local conditions. We are proud to have been recognised in the Australian Financial Review (AFR) Most Innovative Company list in 2020 with Bidim Green.

In 2021, Geofabrics ranked #1 in AFR's Most Innovative Company for Manufacturing and Consumer Goods for Sorbseal.

With a view to the future, we are committed to improving the sustainability of our business by reducing waste to landfill, lowering our carbon emissions and investing in our people.

FINANCIAL REVIEW BOSS
MOST INNOVATIVE COMPANIES

bsi. ISO 9001 Quality Management ISO 9001 Quality Management
FS 673633 FS 590175

Infrastructure Sustainability Council

Visit **geofabrics.co** or call 1300 60 60 20 (AU)
or **geofabrics.co.nz** or call 0800 60 60 20 (NZ)

GEOFABRICS®
Sustainable solutions