

LAND REHABILITATION AND MANAGEMENT INNOVATION

Glencore's Coal Assets sets new benchmarks

Glencore's Australian coal business (Glencore Coal Assets Australia, or GCAA) has pioneered industry best practice approaches to rehabilitate and manage land and biodiversity offset areas at its New South Wales and Queensland operations. These practices and outcomes aligned with SDG15 – Life on land: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

GCAA manages land responsibly across the mining lifecycle through open stakeholder dialogue, planning for and implementation of progressive and temporary land rehabilitation across its sites and trialling of innovative re-grazing approaches.



15 LIFE ON LAND



 **Cardno**

This case study explores how GCAA's holistic approach to land rehabilitation and management supports post-mining land use, biodiversity conservation and continuous improvement of industry performance. It shows how GCAA has embedded contributions to SDG15 within its core business.

While focused on SDG15 – Life on land, GCAA's contribution also supports SDG6 – Clean water and sanitation.

SDG15 – Life on land

Human life depends on the Earth as much as the ocean for sustenance and livelihoods. Roughly 2.6 billion people depend on the land to make a living.¹

At a global scale, deforestation, desertification and biodiversity loss are threatening life on land, and have significant implications for climate change.

As a land manager, mining companies have an important role towards supporting SDG15. Many companies have shown significant leadership, demonstrating considerable progress to reduce the environmental and biodiversity impacts of their operations through state of the art land rehabilitation and ecosystem restoration techniques.²

During 2017, a total of 1080 hectares of rehabilitation was completed at GCAA's mines in New South Wales and Queensland.³

Looking after our land in Australia

Australia is one of the world's 17 megadiverse countries—with flora and fauna renowned for its diversity and profound connection to our Aboriginal and Torres Strait Islander people.⁴ However, Australia's most recent State of the Environment Report found our biodiversity is under increased threat largely due to climate change, land-use change, habitat fragmentation and degradation and invasive species.⁵

Stakeholders—government, businesses, non-government organisations, Aboriginal and Torres Strait Islander peoples, and community groups—are increasingly collaborating through concerted, interlinked efforts and approaches to look after the land.

Mining and its associated infrastructure can also disrupt ecosystems and biodiversity, despite mined land representing less than one per cent of Australia's land mass.⁶ The localised impacts of individual mine sites are important, yet the greatest potential for biodiversity and land impacts occurs through the cumulative effects of multiple projects across regions.⁷

Glencore Coal Assets Australia (GCAA)

Glencore has operated in Australia for nearly 20 years and is one of the country's largest coal producers. GCAA owns and operates 17 mines in NSW and Queensland and employs almost 8,000 people.

GCAA is committed to minimising environmental impacts from its operations and applies the precautionary principle in decision-making. With a significant footprint in NSW and

QLD, GCAA's commitment to progressively rehabilitate and restore land and minimise impacts on biodiversity is critical.

Glencore is one of the largest coal producers in Australia and employs almost 8000 people across its coal business.

Pushing the envelope

GCAA aims to deliver quality rehabilitation to minimise its active footprint to the smallest area practicable, meeting its legal obligations and other applicable global standards and frameworks.

GCAA has also set new standards for openness, accountability and monitoring in establishing processes to meet its commitments and regulatory requirements.

GCAA's rehabilitation program focuses on:

- Improving the business-wide focus and awareness of land rehabilitation, particularly planning
- Progressive rehabilitation or at a minimum, temporary cover
- Establishing Annual Rehabilitation and Land Management Plans capturing quantity and quality of rehabilitation undertaken
- Measuring and reporting progress towards rehabilitation goals, including using science- and data-based monitoring programs.

Land rehabilitation and temporary cover is prioritised to address areas where operations are having the most impact, including on visual amenity, dust generation and areas of particular importance for biodiversity.

Effective engagement as key to defining land management, rehabilitation and use priorities

Moving beyond a focus on regulatory requirements and legal commitments, meaningful stakeholder engagement on land rehabilitation issues has long-term benefits including reducing the likelihood of legacy issues. It also supports a company's ability to develop future projects and maintain and enhance its social licence.

This engagement supports community wellbeing and enables members to discuss and share their own vision for gradual and post-closure rehabilitated land use.

GCAA is committed to this dialogue across its Australian operations. A leading example of this in action is Glencore's involvement in the Upper Hunter Mining Dialogue (UHMD).

Bringing together key representatives (mining companies, community and business leaders, environment groups, residents, regulators, local government and other industries), the UHMD has a mandate to proactively listen, understand and respond to community concerns, establishing an open dialogue about the role of mining and the region's future, including its relationship to other key regional sectors including agriculture and grazing.⁸

Within the UHMD, a working group dedicated to land management established a set of 'final and temporary rehabilitation principles and commitments' for member companies. This spurred further action and innovation, new

1 United Nations Development Program, Goal 15: Life on land. United Nations, 2017, viewed 1 August 2018.

2 International Council on Mining & Metals, Mining and protected areas position statement, 2003, viewed 30 July 2018.

3 Glencore, Upper Hunter Mining Dialogue Final and Temporary Rehabilitation Principles and Commitments. NSW Mining, 2018, viewed August 2018.

4 United Nations Global Compact, Goal 15, United Nations, 2017, viewed 29 July 2018.

5 Commonwealth of Australia, Department of foreign Affairs and Trade, Report on the implementation of the Sustainable Development Goals, 2018, viewed 29 July 2018.

6 United Nations, World Economic Forum, Columbia Center on Sustainable Investment, Mapping mining to the Sustainable Development Goals: An atlas 2016, p. 60, viewed 28 July 2018.

7 CSIRO, Science and solutions for Australia: Biodiversity, 2014, viewed 30 July 2018.

8 Glencore, Upper Hunter Mining Dialogue Final and Temporary Rehabilitation Principles and Commitments. NSW Mining, 2018, viewed August 2018.

partnerships, further engagement and supported industry best practice.

Across its other operations, GCAA is also actively working to identify, prioritise and pioneer—in consultation with key stakeholders—a range of industry-leading practices aligned with community and stakeholder expectations. Examples include reducing impacts on visual amenity through natural landform in mine overburden rehabilitation, and restoring rehabilitated land to its pre-mining uses, including pastures for grazing or native ecosystems.

Key initiatives reshaping the industry's approach to land management, rehabilitation and certification

Pioneering the use of natural landform in mine overburden rehabilitation

GCAA's Mangoola Open Cut mine in the Upper Hunter Valley is adopting natural landform in its mine overburden rehabilitation at a scale not previously seen. Believed to be the largest project of its type in the region, the mine's entire pit disturbance area—some 1,300 hectares—will be returned to landform and vegetation consistent with surrounding undisturbed land.

The Mangoola operation sits within a scenic natural landscape of undulating hills from the Hunter River to the east, and sandstone escarpments to the west. Despite meeting the mine's approval conditions, traditional overburden rehabilitation techniques—uniform slope angles and flat top dumps—were deemed to be inappropriate for the landscape by the Mangoola operation, which employs many people from the local community.

Mangoola revised its final landform plans for the entire disturbance footprint following successful natural landform trials in December 2012. Natural landform design is now considered in all planning decisions, requiring locally-occurring vegetation types to be selected for establishment based on similar topography, slope, aspect and topsoil type. Vegetation types typically include shrubby and open woodland, riparian forest, shrub land and native grassland.

Potential environmental benefits of this project include:

- Increased biodiversity due to a range of topographic relief, appropriate planning for vegetation communities and habitat augmentation, creating a more familiar terrain for fauna species
- Better water quality through stability of landform; reduced erosion potential
- Reduced maintenance due to lack of specific water management structures
- Increased visual appeal in landform; over time the revegetated area should not look like mine rehabilitation.

The Mangoola project is believed to be the first Geofluv™ based landform constructed in Australia. Geofluv™ is a method adaptable to computer design programs that supports design of landforms similar to surrounding areas and can convey runoff water the same way as a natural landform.

Government certification of mine rehabilitation

GCAA worked collaboratively with the Queensland Government, the Queensland Resources Council and other industry members to develop a formal process to better evaluate rehabilitation against agreed standards for a project.

This is an important step for the wider industry as it provides a transparent certification process to achieve government



sign-off once a rehabilitated area meets all required conditions.

GCAA's Newlands and Rolleston Open Cut mines have achieved Queensland Government certification for areas of their rehabilitation in the past two years.

- For Newlands, the requirement for certification was to provide habitat suitable for flora and fauna within overarching objectives of being safe, stable, non-polluting and sustainable
- At Rolleston, the area of rehabilitation that achieved certification complies with all conditions for sustainable post-mining use and in coming years will be used for grazing cattle.

GCAA's focus on progressive rehabilitation and post-mining land use means that further submissions for certification will soon be made for its Newlands, Rolleston and other Queensland mining complexes at Oaky Creek and Collinsville mines.

Newlands achieved certification for 73 hectares of rehabilitation in 2017 (the first time that rehabilitation of mine overburden spoil has ever been certified) followed by 220 hectares of rehabilitation at Rolleston in 2018.

Utilising rehabilitated land for grazing — the Liddell Grazing Trial

At its Liddell Mine in the NSW Upper Hunter, GCAA undertook a five-year trial to explore whether rehabilitated mining land can support cattle grazing sustainably and on a scale at least equivalent to its pre-mining capacity—a key community concern.

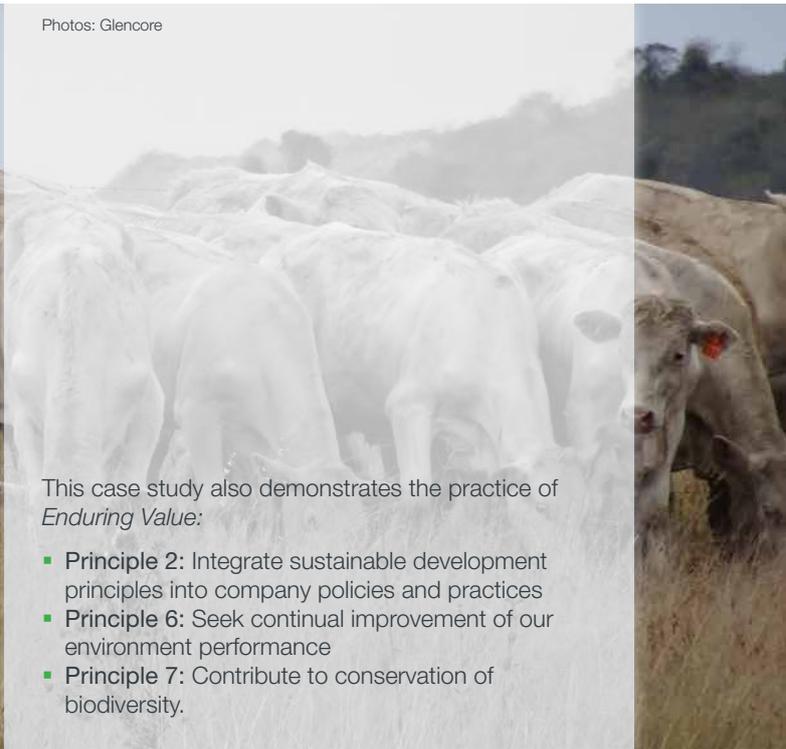
The trial focused on identifying gaps in knowledge and opportunities for further trials or research, with objectives including:

- Assess and compare performance of a rehabilitation grazing site against an adjoining 'unmined' grazing site
- Inform the development of guidelines for the management of grazing on rehabilitation areas.

In each of the rehabilitation and unmined areas, the trial has used up to 30 Charbray steers sourced from local breeding stock, randomly selected and placed into rehabilitated or natural pastures over varying periods. Stocking rates have been at or above district averages established by the NSW Department of Primary Industry. During the trial, the cattle were monitored and testing undertaken against a range of soil, water, pasture and livestock parameters.



Photos: Glencore



This case study also demonstrates the practice of *Enduring Value*:

- **Principle 2:** Integrate sustainable development principles into company policies and practices
- **Principle 6:** Seek continual improvement of our environment performance
- **Principle 7:** Contribute to conservation of biodiversity.

Results from the trial are encouraging. Broadly, baseline monitoring of water quality (salinity, acidity, toxic elements) found stock water in dams within both paddocks was of suitable quality for grazing cattle. Quality measurements showed rehabilitated pasture generally has a higher feed quality, resulting in better cattle performance. Cattle grazed on rehabilitated land also grew significantly quicker and to a larger overall weight than cattle on unmined sites.

The Liddell grazing trial has involved four phases over a five-year period, during which cattle on rehabilitated pasture have out-performed those on natural pasture and rehabilitated land has proven to be capable of supporting commercial grazing over longer timeframes.

Environmental outcomes

A strong internal focus on land management and mine rehabilitation has enabled GCAA to minimise its active mining footprint and rehabilitate mined land to self-sustaining native ecosystems or for agricultural and other use.

GCAA mines completed rehabilitation on a total of 1080 hectares of land in 2017. In addition, in 2017 GCAA rehabilitated, and will rehabilitate in 2018, more land than it disturbs across its operations.

GCAA's focus on mine rehabilitation, backed by scientific rigour, analysis and the use of new technology, has also supported continuous improvement of mine rehabilitation processes across the broader minerals industry.

GCAA's work with Queensland Government agencies and other industry stakeholders to develop a formal and transparent certification process for rehabilitation provides clarity for industry, governments and communities. This will enable other companies to engage in the certification process, which will support improved environmental outcomes.

Lessons

- Engaging in meaningful and open discussion with key stakeholders—such as the Upper Hunter Mining Dialogue and other forums—drives industry collaboration to address the cumulative impacts of mining activities in various mining regions
- As processes are refined, GCAA's sites set more challenging land management targets embedding a culture of continuous improvement. This culture enables companies and industry to respond to changing expectations and embed environmental management approaches.
- Engaging in meaningful and open discussion with key stakeholders through the Upper Hunter Mining Dialogue and other bodies has also supported cross-industry collaboration to reconceptualise land use post-mining. Community concerns and priorities are reflected in planning.