



Australian Government  
Australian Trade and Investment Commission



# Accelerating Sustainable Mining

Australian Mining Equipment,  
Technology and Services (METS) sector





Australian Government

Australian Trade and Investment Commission



## Empowering Green Ambition

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Austrade has the expertise, the contacts and the market intelligence to help grow Australian businesses and build Australia's economic prosperity.

Australian Mining Equipment, Technology and Services (METS) products and services are known for their innovative processes and operational efficiencies developed over decades of continuous improvement working with world leading resource companies, and are well established in supporting sustainability and decarbonisation objectives.

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Austmine is the leading not-for-profit association for the Australian Mining Equipment, Technology and Services (METS) sector. Austmine exists to promote the global advancement of technology and innovation in mining, and support members so they can achieve greater success.

Austmine's membership reflects the impressive diversity of the METS sector, representing a range of companies from multinational software, engineering, and manufacturing firms; to agile start-ups, small and medium enterprises (SMEs) and technologists; through to research, education, government and professional services.

Austmine partners with mining organisations around the world to help them achieve their sustainability, productivity and safety goals through creating strong connections to the technologies, innovations and expertise of the Australian METS sector.

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### Acknowledgement of country

In the spirit of reconciliation we acknowledge the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

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# Sustainable Mining Technologies

## Why Australia

The mining industry plays a critical role in securing a sustainable future for our planet. Mining provides the essential resources needed to create the renewable energy technologies, electric vehicles, green construction materials, medical devices and space technologies that will guide the world's sustainable economic and social development across the next century.

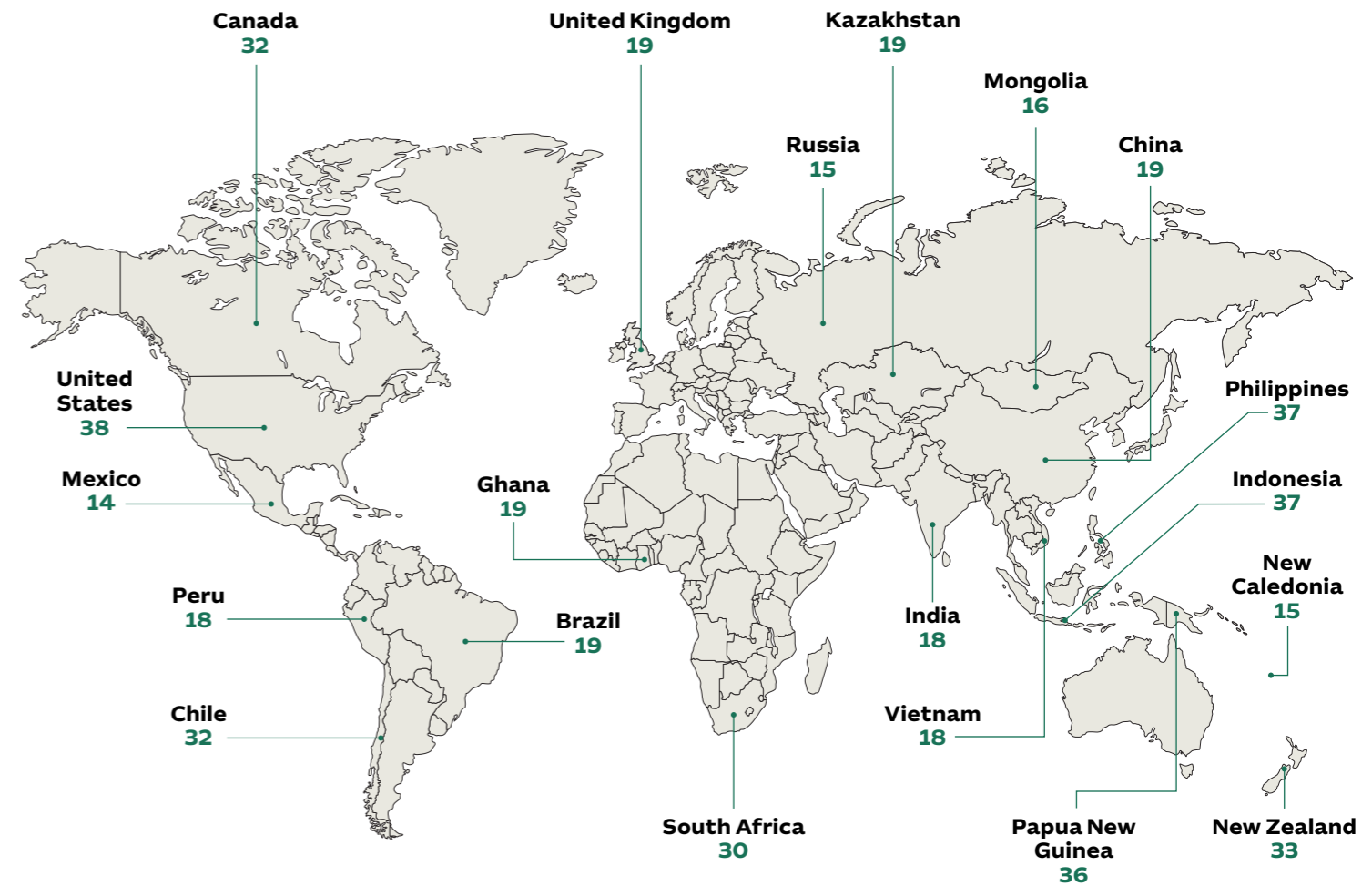
To ensure the responsible delivery of resources for current and future generations, mining must strike a balance between increasing production of minerals and adopting more sustainable operational practices. To reduce impacts on the environment and secure social licence to operate, mining must look to new technologies, processes and business models in its pursuit of sustainability.

In this pursuit, Australian Mining Equipment, Technology and Services (METS) companies are natural partners for the global mining industry.

The Australian METS sector has been at the forefront of developing and implementing innovative practices and cutting-edge technologies for mining operations around the world. Driven by a pioneering spirit and a commitment to excellence, METS companies have become renowned for solving the most difficult industry challenges in the harshest global mining environments, from large-scale open-pit copper mines in the Atacama Desert of Chile to complex underground gold projects in the subzero temperatures of Northern Canada.

**Figure 1. Australian METS Export Destinations in 2020 (Austmine National METS Survey 2020)**

For METS companies that are engaged in exporting, the below figure illustrates the key international markets by percentage of companies exporting to the destinations.



It is this entrepreneurial approach and willingness to take on a challenge that has led the Australian METS sector to be one of the most internationalised sectors globally. Over 65% of Australian METS companies export, and they have established sophisticated supply chains, strong

partnerships, and collaborative relationships to quickly and efficiently respond to customer needs around the world.

**Figure 2. Australian METS snapshot (Austmine National Survey 2020)**



**\$114bn** AUD  
Total Revenue



**300,000+**  
Highly skilled professionals



**9/10**  
Consider Innovation Important



**64%**  
Involved in Collaborative Projects



**65%**  
Export



**26%**  
Specialise in Sustainability Solutions



**32%**  
Have capabilities in Digital Technology & Automation



**37%**  
Consider Technology a Key Opportunity

The harsh operating climate in Australia has focused the Australian resources and METS industry on sustainability. As we collectively strive to rise to the challenge of climate change, the Australian METS sector has increased this focus providing innovation and expertise to support the mining industry in becoming global sustainability leaders.

In this publication, we showcase some of the innovative sustainable solutions that the Australian METS sector has to offer, and compelling examples of where their technologies, ideas and know-how have been implemented to overcome the most challenging environmental and social issues.

We focus on the key areas of sustainability that are impacting operations now and into the future, looking through the lens of where the industry is striving to be if we can successfully accelerate sustainable practices.

**The Smart Water Mine:**

Demonstrating the solutions needed to protect our most precious shared global resource – water. Ranging from mine water management and monitoring through to water treatment and desalination.

**The Community Mine:**

Re-imagining the traditional relationships between mines and communities to create value for local stakeholders, preserve cultural artefacts and improve the public perception of mining.

**The Zero Carbon Mine:**

Showcasing the practices adopted to monitor, analyse and reduce carbon emissions from mining operations, including renewable power generation, electric vehicles and energy efficient systems.

**The Small Footprint Mine:**

Leading a fundamental shift in the business models and operational practices of mining companies to create more precise, adaptable, and low impact projects ready for the future.

**The Waste Free Mine:**

Investigating the circular economy methodologies that can be utilised to take mine waste and turn it into valuable building materials, energy technologies and precious resources.

As the industry seeks to work collectively to shape a sustainable mining industry, we look forward to building partnerships between the Australian METS ecosystem and mining companies across the globe.

# Sustainable Mining: The Smart Water Mine



Reducing water consumption and ensuring quality water for communities is a key necessity in moving toward a more sustainable mining industry.

Mining operations and minerals processing are traditionally water-intensive, so there is an urgent need to adopt new practices and reduce impacts on water sustainability.

Australian METS companies have embraced the challenges of water consumption and conservation. They are at the forefront of developing smart solutions that are reshaping the landscape of responsible mining, and forging a path toward a more efficient, eco-conscious, and water-resilient industry.

Australian METS companies have expertise in water treatment technologies, innovative mine water management practices, water conservation methodologies, advanced water quality

monitoring and control systems, state-of-the-art desalination processes, and water reuse and recycling technologies unique to the demands of mining operations.

#### Key business capabilities:

- Water treatment technologies
- Mine water management
- Water conservation techniques
- Water quality monitoring & control
- Water reuse and recycling
- Desalination processes

## Case Study

Technology to safely release mine water into sensitive environments



**Company name**  
Evocra

Evocra is an Australian-owned water treatment company offering solutions to remove hazardous contaminants from often difficult-to-manage water sources to improve the quality of the water for reuse or release. Its solutions have a broad range of applications over many mining and other heavy industries to resolve complex water contamination issues, while providing improved water resource economics and sustainability.



#### Customer description

A large coal mining company operating near sensitive human and natural environments.

#### Problem

The subject site, a coal mine operating in a sensitive natural heritage area, invited Evocra to evaluate their current water treatment process and provide advice on possible solutions to meet their stringent water release criteria.

Underground mine water was impacted by heavy metals, requiring expensive treatment to allow discharge into nearby sensitive natural waterways.

Like many mining sites, this operation had historically used a traditional pH adjustment, oxidation approach with dissolved air flotation (DAF) to remove heavy metals from the affected water.

Analysis showed that the mass of reagent addition was more than 34 times the mass of the target metal load. This disproportionate reagent use increased the mass of the waste sludge being produced and requiring subsequent disposal by approximately 97%.

#### Solution

Evocra proposed its patented Ozofractionative Catalysed Reagent Addition (OCRA) process as a solution to meeting the water treatment requirements while significantly reducing the client's operating costs.

Evocra's initial analysis of the existing water treatment process indicated that three of the reagents used in the process were superfluous, providing no benefit to the process, with immediate cost savings to be gained from their removal.

Evocra conducted a series of trials on raw water originating from the mine site utilising the OCRA process which demonstrated that the technology effectively removed metals from affected mine waters, meeting the site's stringent discharge requirements.

### Results

Results of the trials proved that the OCRA process effectively removed the target metals of concern – cobalt, zinc, nickel & manganese – below the regulatory authority's enforced limits, allowing discharge to the local sensitive environment.

The OCRA process reduced the concentrations of the priority contaminants by 99.9% for cobalt, 99.4% for zinc, 98.9% for nickel and 78.1% for manganese. In addition to meeting the priority pollutant criteria the OCRA process also

removed 89.6% of copper, 88.6% of cadmium and 72% of iron present in the water. Copper and cadmium were removed to below laboratory detection limits.

While there are a range of reagents that can be applied to heavy metal contaminations via the OCRA process, Evocra continued the use of lime to allow direct operational economic assessment. Results showed that the replacement of the clients' traditional process with the OCRA process would lead to a reduction of lime usage by greater than 80%, and a 69% reduction in sludge production, providing significant cost reductions in reagent procurement and waste management.

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# Case Study

## Solids removal to save water and increase pump life



**Company name**  
**OLEOLOGY**

**OLEOLOGY provides engineered water treatment solutions to the mining industry, including advanced oily water separators, PFAS (Perfluoroalkyl and Polyfluoroalkyl Substances) removal to non-detect, and water recycling/reuse. For the past 21 years OLEOLOGY has led water technology innovation with new and robust technologies fit for common and challenging applications.**

### Customer description

A multinational tier-one underground gold mining company with multiple site operations located in Western Australia.

### Problem

The client is located in a dry, remote area with finite water resources, and they were running out of water supply options.

OLEOLOGY was engaged to design a robust solution to recycle water for use in their underground mining operations. They were seeking to remove solids from the water so their pumps would not suffer from the seals prematurely failing.

### Solution

The client contracted OLEOLOGY to undertake a detailed Phase 1 (Raw) & and Phase 2 (Treated) test and trial program. The test and trial stage included passing the client's water from site through a scaled-down system to prove the efficiency of the stage of the filtration process.

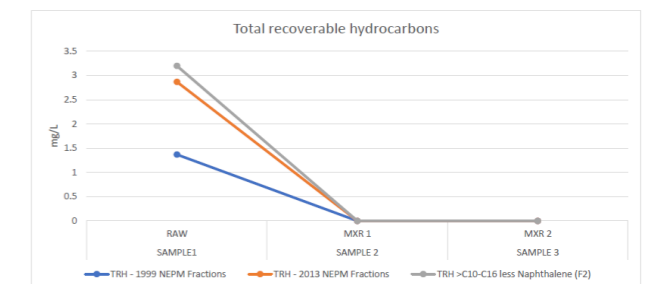
The system designed by the OLEOLOGY Research and Engineering Department features 2 sets of 2 regenerable media vessels in parallel, with automatic backwashing based on scheduled variable parameters. An integral filter press also reduces the waste to a solid that the customer can easily dispose of.

The client was able to avoid chemical dosing and, with only a media filtration, the solution was simple, robust and automated. The client will also have significantly reduced annual operational expenses as the media will last up to 8 years.

### Results

As evident from the Phase 2 results, the new system discharges water below the client's requirements for solids content. The solids removed by the robust solution designed by OLEOLOGY ensure that the water can be used for underground activities, and the client's pumps operate more efficiently, saving their bottom line.

### Phase 2 – Staged Filtration Results below.



	SAMPLE1	SAMPLE 2	SAMPLE 3
	RAW	MXR 1	MXR 2
TRH C10 – 1999 NEPM Fractions	1.37	<0.04	<0.04
TRH – 2013 NEPM Fractions	1.5	<0.05	<0.05
TRH >C10-C16 less Naphthalene (F2)	0.33	<0.02	<0.02

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# Australian METS Capabilities

## The Smart Water Mine

	Water treatment technologies	Mine water management	Water conservation techniques	Water quality monitoring & control	Water reuse & recycling	Desalination processes
BeyondLOM	●	●	●	●	●	●
CDS		●	●		●	
Clean&Recover	●	●			●	
Concept Environmental Services	●	●	●	●	●	●
EMM Consulting		●	●	●		
Envirosuite Operations	●	●		●		
Evocra	●	●			●	
Hydro Australia		●				●
Liquid Integrity Systems		●	●			
Magnum Australia		●	●			
OLEOLOGY	●	●	●	●	●	
Phibion		●	●		●	
Sedgman			●			
Worldpoly	●	●	●	●	●	●



# Sustainable Mining: The Community Mine



A sustainable and greener mine is not solely defined by its operational efficiency and reduced environmental impact, but also by the positive legacy it leaves on the community in which it operates.

Australia possesses a deep appreciation for Indigenous cultures, facilitated by its diverse heritage. This cultural sensitivity is complemented by a robust regulatory landscape that prioritises community engagement, environmental integrity, and social responsibility.

Community engagement is intertwined with issues of social impact assessment, Indigenous and local community relations, diversity and inclusion, and mine closure planning and implementation. Engaging with the community ensures that project benefits are equitably distributed, and potential negative impacts are mitigated. A holistic view of sustainability includes not just the immediate environmental concerns but also the well-being of the people affected by mining activities.

Australian METS companies have developed products and services to weave social and ethical considerations into mining processes, recognising the integral relationship between mining operations and the well-being of stakeholders.

#### Key business capabilities:

- Stakeholder engagement expertise
- Cultural heritage preservation
- Social impact assessment
- Indigenous & local community relations
- Labour relations
- Diversity & Inclusion
- Mine closure planning & implementation

## Case Study

Helping miners improve social licence to operate



**Company name**  
K2fly

**K2fly is a technology provider of enterprise-level Resource Governance solutions to asset intensive and extractive industries. Their solutions drive towards 'net positive impact' in ESG compliance, disclosure, and technical assurance, through platform-based SaaS cloud solutions.**

**K2fly's Natural Resource Governance suite integrates data for Land Access, Cultural Heritage Management, Community engagement, and Ground Disturbance permitting into one enterprise level knowledge base. This provides the foundation for risk management, stakeholder inclusion, transparency, and governance that mining companies can be proud of. K2fly's solution is spatially integrated and provides the data integrity required to maintain and improve on a company's social licence to operate.**

#### Customer description

An iron ore miner in Australia and the Americas.

#### Problem

The process of obtaining access and approvals to land is extremely complex as companies need to adhere to ESG requirements and outcomes. The client was trying to navigate through this landscape by engaging stakeholders to manage risk but found it difficult to monitor and track progress. They were using internal databases,

spreadsheets and disparate systems to manage this resulting in challenges with data consistency, integrity, sharing and governance.

#### Solution

K2fly's Land Management solutions span across access to land, cultural heritage management to ground disturbance permitting and approvals. This provided the client with an effective, transparent process to help ensure obligations are understood, risks mitigated, and strong resource governance remained evident for all stakeholders. It allowed the client to centralise stakeholder communications, interactions and grievances, create integrated workflows and visualise the information required to support land access across tenements, infrastructure and approvals.

#### Results

The results obtained were in a singular platform to maintain social licence to operate by addressing the multifaceted challenges of land management, access agreements, conducting assessments and gaining approvals. In addition, the platform provided certainty in the process of managing acquisition / relinquishment and annual expenditure disclosures. It also allowed the client to reduce risk through governance of key data and decisions. They were able to apply, approve, track, report and submit closure of their ground disturbance permits and rehabilitation commitments all through one database.

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# Case Study

## Monitoring hydration for a healthy work community



**Company name**  
**MX3 Diagnostics**

**MX3 Diagnostics is a health technology company that specialises in non-invasive point-of-care diagnostics. MX3's customers include mining, construction, pro-sports, emergency services, and military groups who use their unique saliva-based hydration assessment technology to enhance their performance and safeguard against adverse events.**

### Customer description

Newcrest Mining is Australia's leading gold mining company, with operations in Australia, Papua New Guinea and Canada. Newcrest's Telfer Mine in the East Pilbara region of Western Australia is one of Australia's largest gold and copper mines, with both open-pit and underground operations.

### Problem

Hydration is a key factor influencing the resilience of workers to heat strain and heat related injuries. Inappropriately managed, heat stress can place significant physical strain on workers, leading to serious and chronic health issues, and dramatically reducing productivity. Direct measurement of hydration is an essential component of heat-management on the mine site.

Newcrest Mining wanted to identify hydration assessment technologies which could improve safety at their Telfer mines. Prior to engaging with MX3, Newcrest relied on urine-based hydration assessment approaches, which were imprecise, inconvenient and invasive. Newcrest was looking for an alternative solution which could allow their

workforce to regularly self-monitor hydration levels, minimise disruption to regular tasks, and provide clear actionable guidance to allow workers to take corrective action and avoid heat-related injuries.

### Solution

To address Newcrest's hydration management needs, MX3 introduced the MX3 Hydration Testing System (HTS).

The MX3 HTS is a handheld system that assesses hydration by determining Salivary Osmolarity with disposable test strips that collect saliva directly from the tongue. Using saliva to monitor and track hydration status via the MX3 HTS is a quick, convenient, non-invasive, and accurate way to assess hydration status of workers.

Hydration assessments with the MX3 HTS are completed in seconds – minimising disruption to workflows, and helping workers prepare, perform, and recover when working in extreme conditions.

MX3 hydration assessments are automatically logged through the MX3 App and Portal, allowing organisations to easily generate insights into workforce hydration and demonstrate compliance with heat stress management procedures.



### Results

In late 2019, Newcrest conducted a pilot trial of the MX3 HTS at Telfer and found the system to be an easy to use and effective alternative to their existing urine-based hydration assessment approaches.

Following this pilot, Newcrest conducted a site-wide roll out of the MX3 HTS at the Telfer mine and made the use of the HTS mandatory for all on-site contractors. Newcrest has now introduced the technology at a range of

other sites and exploration operations across Australia as part of their standard heat-stress management practices. Each year Newcrest conducts approximately 100,000 MX3 hydration assessments to ensure workers are hydrated and ready for work.

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# Case Study

## Quantifying community engagement through data



### Company name Voconiq

Voconiq is a data science and engagement company that works with industry to assist in building stronger and more productive relationships with community. Its solutions are grounded in engagement science and include smart community surveys, proprietary analytics and flexible reporting.

### Customer description

Yamana Gold is a mid-sized multinational mining company operating in Canada, Brazil, Argentina and Chile. In 2015 the company adopted a new approach to measuring health and safety, environmental and social risks across the company. As part of that approach, Yamana Gold has been working with Voconiq to develop their social licence indices across all operational sites.

### Problem

Yamana Gold had found it difficult to measure, communicate and address social licence issues within the organisation because of a lack of systematic measurement. Having regular and structured site-by-site measurements of trust and acceptance, as well as the factors underpinning them, changed that.

*“In a fast-paced environment such as mining, it can be challenging to get the attention of the management team and to facilitate action, when we don’t have data to back up the narrative.”*

*“[The social licence measure] takes it out of the realm of anecdotal qualitative data, and takes it into the realm of science... and we’re surrounded by engineers and finance people who live on data.”*  
Aaron Steeghs, Yamana Gold

### Solution

In designing the company’s new social licence measure (based on Voconiq Local Voices data), Yamana Gold staff asked themselves – what does the general manager of a mine site really need to know about the community, and what does the CEO and the Board really want to know? Those principles fed through into two key features of the new measure.

The first feature is to ensure that it produces actionable, strategic data – to know what’s happening on the ground; what people think about the company; and how it can be improved. The second feature is to ensure that that data has direct visibility within the company – that it goes to site general managers, senior executives and board members.

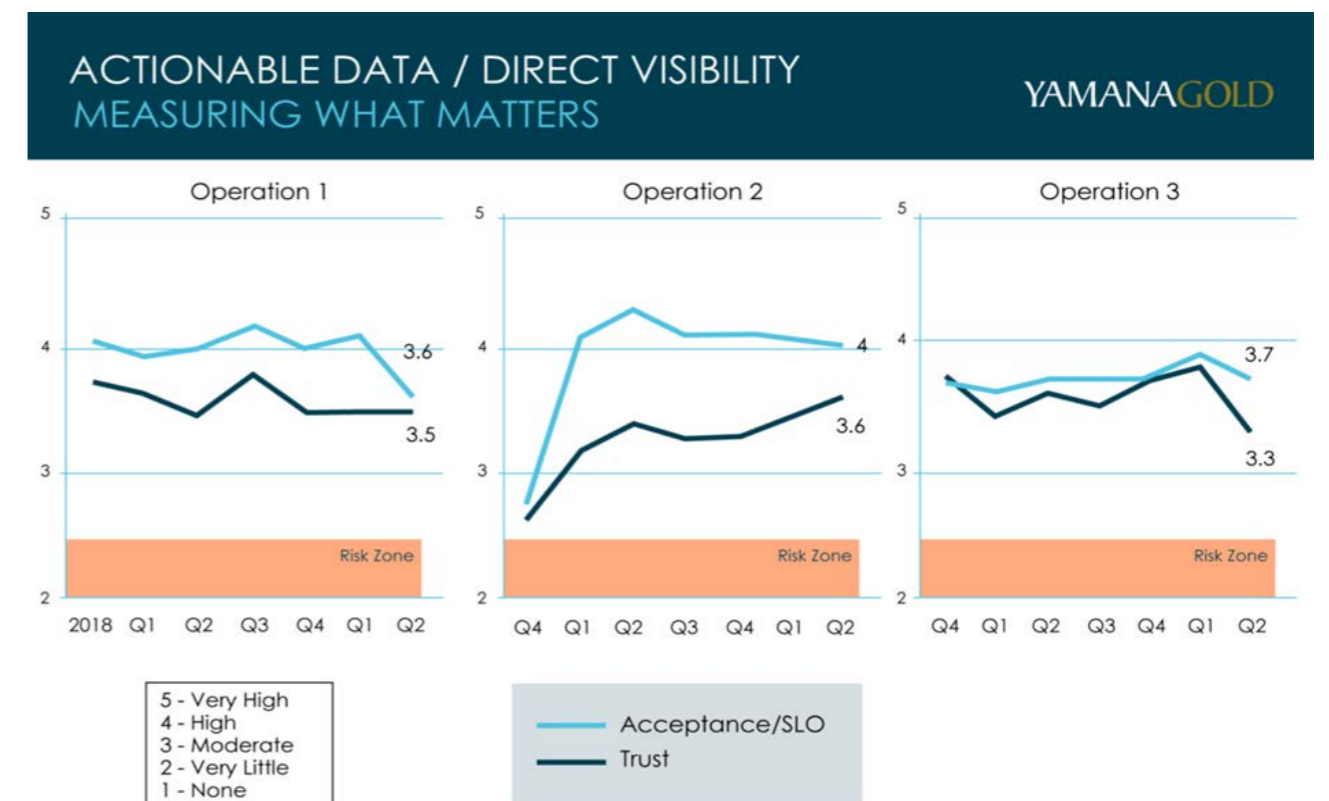
### Results

The company identified a significant dip in the trust scores at one of their sites (‘Operation 3’), and while the scores were still above the ‘risk zone’, it immediately led to action within the company. Within a week of those results coming into the company they had been communicated to the site general manager and community relations teams; to senior functional managers at headquarters. Through these informed conversations, and by digging deeper into the Local Voices data, the company was able to get a better sense of what was going on and what kind of actions they would need to take to address the drop in community trust.

*“Within a week of getting these results I was on calls with our senior managers...that kind of phone call has never happened for me unless there was an issue at one of the sites; unless there was a protest; unless there was a roadblock; unless there was some sort of significant issue...And we can have the conversation before a situation gets bad...this tool is like the early warning system to say ‘something is not right here, let’s fix it’.”* Aaron Steeghs, Yamana Gold

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# Australian METS Capabilities

## The Community Mine

	Stakeholder engagement expertise	Cultural heritage preservation	Social impact assessment	Indigenous & local community relations	Labour relations	Diversity & inclusion	Mine closure planning & implementation
BITQ				●	●		
Carbon Neutral	●	●	●	●			
Earth Technology							●
EMM Consulting	●	●	●	●			●
Envirosuite Operations	●		●				
GeoMoby		●					
K2fly	●	●		●		●	●
MX3 Diagnostics	●					●	
Parvate ESG	●		●				
PX4 Software	●			●			
Sentient Computing	●		●	●			●
SpaceDraft	●	●	●	●	●	●	●
Voconiq	●		●	●	●		●



# Sustainable Mining: The Zero Carbon Mine



Mining has an important role to play in combating climate change, and adopting zero carbon practices is a key part of reducing operational emissions, and the impacts mining has on the environment

Beyond environmental benefits, a zero carbon approach enhances operational resilience by reducing dependence on fossil fuels and aligning with evolving regulatory and market expectations, ensuring long-term viability and competitiveness.

The Australian mining industry has taken a significant step towards sustainability by embracing ambitious zero-carbon targets, and Australian METS companies play a substantial role in providing technologies and services to assist mining companies to achieve these goals. Australia's distinctive challenges, stemming from its vast geographical expanse, reliance on fossil fuels, and dedication to environmental stewardship, have created a culture that drives METS companies to engineer pioneering solutions that prioritise sustainability.

Through innovation, adaptability and a deep understanding of the industry's intricacies, Australian METS companies are leading the charge towards a sustainable, greener, and more responsible industry.

Australian METS companies play a pivotal role in aiding mining companies to attain their zero carbon goals. They offer a broad range of solutions across areas such as carbon capture and storage, energy storage systems, clean energy solutions, seamless integration of renewable energy into existing grids, meticulous energy efficiency measures, determined electrification efforts, pioneering hydrogen fuel technologies, and innovative renewable energy applications tailored specifically for mining operations

#### Key business capabilities:

- Carbon capture and storage
- Energy storage systems
- Clean energy solutions
- Renewable energy grid integration
- Energy efficiency measures
- Electrification
- Hydrogen fuel technologies
- Renewable energy technologies for mine operations

## Case Study

### Battery systems to support underground mine vehicle electrification



**Company name**  
**3ME Technology**

**3ME Technology delivers clean energy technology to mining, developing and deploying powerful, zero-emission battery electric systems for mining vehicles and equipment. It specialises in custom designing and manufacturing safe, energy-dense lithium-ion battery and drive systems that power mining and heavy-duty equipment. 3ME Technology's current and future capabilities span battery systems, systems integration, remote cyber-secure asset monitoring, and in-field support, providing a true end-to-end solution for off-highway electrification. They prioritise electrification of underground mining equipment.**

#### Customer description

3ME Technology operates through a partnership model, collaborating with several Australian and international mining OEMs, prominent miners and contractors. They currently export their battery systems globally. The customer in this example is an underground mining vehicle and equipment manufacturer (OEM) although 3ME Technology also works directly with miners.

#### Problem

As industry transitions to new energy sources, a robust battery supply chain becomes essential as large-scale battery uptake is a pivotal component of the energy transition. The most urgent challenge in the underground mining sector is the necessity to eliminate diesel particulate matter

for miner safety and long-term health whilst concurrently making mining more efficient for environmental and productivity reasons.

The customer was seeking to convert both existing and new underground vehicles and loaders from diesel to electric.

#### Solution

3ME Technology designed a customised full battery electric integrated system utilising their in-house, proprietary engineering capability. The solution included battery design, remote battery and asset monitoring system, full system integration, factory and site testing and ongoing support using 3ME Technology's proprietary products:

**BladeVOLT® Battery System:** Designed specifically for safety-critical sectors, BladeVOLT® ensures protection against thermal runaway threats, making it suitable for demanding environments like underground mining and air cargo transportation.

**BladeDRIVE Control System:** This comprehensive system encompasses software, hardware, and electrical components for precise vehicle control, traction systems, and mobile power solutions.

**BladeNET Telemetry System:** Offering remote, cyber-resilient monitoring, BladeNET seamlessly integrates with existing networks or fleet management systems.

**BladeCHARGE System:** Facilitating lithium-ion battery charging via standard mining 1000VAC sources.

**Systems Integration Expertise:** Their proprietary software effectively manages sophisticated systems in vehicles like the electric Bushmaster (3ME Technology Stealthmaster® system) and underground mining equipment.



Experienced Engineering Team: Their team's expertise spans mechanical, electrical, software, hardware, and systems integration, ensuring comprehensive support.

Established Field Service Capability: 3ME Technology offers robust field service support for field trials and testing.

### Results

Through implementing a 3ME Technology customised solution the OEM was able to offer miners a solution that:

- Improved health & safety underground through eliminating diesel particulate matter (dpm) and reducing noise, heat and vibrations
- Supported meeting decarbonisation goals and progressing towards all electric mining operations

- Achieved lower total cost of ownership (TCO) through significantly reduced maintenance and operating costs
- Supported effective change management with appropriate risk management, training and solutions that minimise impact on workers and operations.

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# Case Study

## Electric personnel carrier vehicles for underground mines



**Company name**  
**Ampcontrol**

Ampcontrol solves the world's most complex problems in energy through collaboration, developing leading innovations that push industry to decarbonise. It creates world-first energy solutions of scale using innovation partnerships, smart people and advanced Australian manufacturing. Ampcontrol seeks to lead the global energy revolution and make net zero a reality for all industries.

### Customer description

Through collaboration with joint venture partners, the University of Newcastle, ResTech, and Solitech, AMPCONTROL has developed DRIFTEX, a Battery Electric Personnel Carrier Vehicle (BEV), to meet the environmental and safety needs of underground mines.

### Problem

With a growing and immediate industry demand for low emissions technology, the underground mining industry was seeking a solution to eliminate diesel emissions in underground applications, supporting fewer ventilation requirements and reducing noise.

DRIFTEX came into development to address burgeoning health and sustainability concerns for miners and to reduce the growing amount of diesel emissions experienced across the mining industry.



### Solution

DRIFTEX is a Battery Electric Vehicle (BEV) designed for use in underground mining applications. This world-first innovation incorporates a 60kWh intrinsically safe battery management system which provides ten years of operation in a typical use cycle.

DRIFTEX seamlessly integrates to any standard EV charger, not requiring proprietary charge equipment. The battery's cooling system supports fast-charging capability, enabling a full battery charge in 10 minutes with high-powered DC fast chargers.

DRIFTEX operational advantages include multicolour intrinsically safe headlights, IoT connectivity to improve operation maintenance and fault finding. DRIFTEX has two 100kW motors, with a combined 1500 Nm of output torque.

### Results

Reduced diesel emissions and noise result in greater protection of work health and wellbeing as well as reduced underground ventilation costs. This technology supports the reduction of site environmental emissions, contributing to improvements in the social licence and sustainability goals of the mine.

The inclusion of IoT capability enables connectivity and enhanced data collection for efficient monitoring and management. Moreover, users have the flexibility to customise the technology according to their specific requirements, resulting in a net zero pathway.

The DRIFTEX innovation won an award for Health Excellence at the 2023 NSW Mining Health, Safety, Environment and Communities (HSEC) Awards.

DRIFTEX has provided positive operational impacts to the mining environment through:

- reduction in diesel particulates / diesel particulate filters,
- reduction in diesel usage (decarbonisation, operational expenditure),
- whole body vibration (WBV) improvements,
- noise reduction (hearing protection is no longer required),
- improved ergonomics and driver visibility,
- equivalent charge / refuel time, eliminating concern over charge times,
- better monitoring and fault finding tools with full instrumentation,
- IoT leading to driver assistance aids, the basis for autonomous vehicle, real time monitoring, location identification (emergency response),
- improved lighting,
- ease of customisation to site specific requirements with everything monitored and customisable in the software
- reduced maintenance and inspections as monitoring system identifies when required.

### Contact

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# Australian METS Capabilities

## The Zero Carbon Mine

	Carbon capture and storage	Energy storage systems	Clean energy solutions	Renewable energy grid integration	Energy efficiency measures	Electrification	Hydrogen fuel technologies	Renewable energy technologies for mine operations
3ME Technology		●	●		●	●		
Ampcontrol			●	●	●	●	●	●
Antrak Logistics			●		●			
Carbon Neutral	●	●	●	●	●	●	●	●
Decarbify	●		●		●			●
DGaS Services		●			●		●	●
Earth Systems			●	●	●			●
Elwa Energysavers			●		●	●		
Galetech Australia		●	●	●	●			●
Gekko Systems						●		
GHD	●	●	●	●	●	●	●	●
Globo Hydro Power							●	
Green Gravity		●		●				●
Hanson Australia	●	●	●	●	●	●		●
KiTech Hydrogen Systems			●				●	●
Lightning Protection International					●			
Magnum Australia							●	
Minnovare					●			
Opatrix					●			
RWDI	●							
Scantech International					●			
Undercon					●			

# Sustainable Mining: The Small Footprint Mine



Mining organisations will need to fundamentally re-think what a mining operation looks like, transforming traditional capital, resource and energy intensive practices and procedures as we progress to a more sustainable mining industry.

Australian METS companies are pioneering new ways of mining for their customers across the globe that reduces the potential impact and size of mining operations.

Advanced visualisation technologies, powerful sensors and navigation tools are being utilised to identify and precisely extract the most fertile orebodies, eliminating waste and reducing costs in this process.

Australian METS companies are working with customers to transform managerial mindsets and change operational culture to create more agile and modular mine designs that leverage advancements in manufacturing and simulation software.

Cutting-edge technologies and deep domain knowledge are being utilised to reduce the lasting impact of mining operations, restoring critical ecosystems and rehabilitating land.

Australian METS companies are disrupting the status quo in the mining industry. They offer expertise that will reduce the size and impacts of mining operations, including methodologies of agile mine design, in-situ recovery, low impact processing, biodiversity monitoring and land reclamation.

### Key business capabilities:

- Agile and modular mine design
- Precision mining technologies
- In-situ recovery techniques
- Low impact processing methods
- Green mining practices
- Ecosystem restoration
- Biodiversity conversation
- Land reclamation

# Case Study

Optimising the environmental footprint of mineral extraction



**Company name**  
Gekko Systems

Gekko Systems is a global leader in mineral processing, providing fully integrated solutions to mining companies around the world. Over the past 25 years, Gekko has developed strong capabilities in the design, manufacturing, installation and commissioning of energy efficient modular mineral processing equipment and complete plants for a wide range of minerals including gold, silver and polymetallics.

### Customer description

Alphamin Resources Bisie Tin Mine is a low-cost tin concentrate producer in the North Kivu Province of the Democratic Republic of Congo (DRC).

### Problem

Whole of ore processing was going to potentially challenge the project's economic viability. The mine sought to make the tin processing operation as efficient and environmentally sustainable as possible, while reducing capital and operating costs to ensure economic profit margins.



## Solution

Utilising its compact InLine Pressure Jig (IPJ) Gekko Systems introduced a pre-concentration circuit to the tin processing operation.

The IPJ circuit reduced the mass to the downstream concentrator while retaining >90% of the metal through gravity pre-concentration stage. The pre-concentration process reduced the downstream concentrator feed from 57 tonnes per hour to 9 tonnes per hour.

This reduction in the size of the concentrator significantly reduced the mass of chemically contaminated plant residue.

## Results

Significantly reduced capital and operating costs and increased process efficiencies were achieved by pre-concentrating the feed ore using the IPJ.

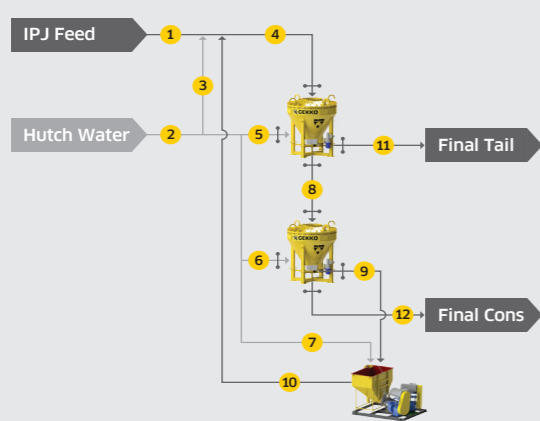
Improvements included:

- 97% tin recovery
- 20% reduction in energy use
- 10% reduction in water use
- Large portion of chemical free sand-like tailings that can be re-used on site
- Capital and operating cost savings of approximately 50%

## Contact

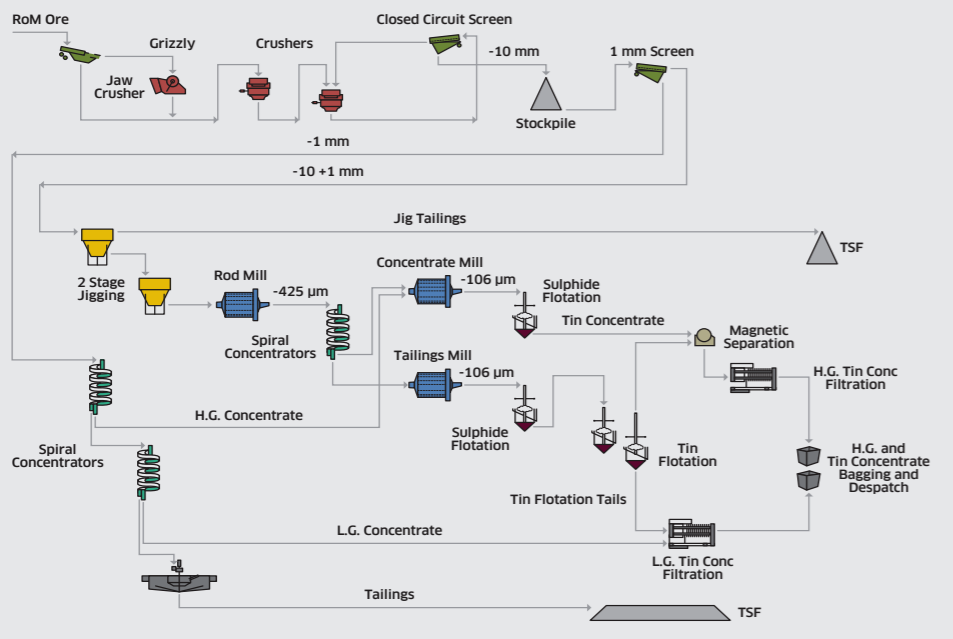
[www.gekkos.com](http://www.gekkos.com)  
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Original IPJ Process Flow Diagram



Flow	TPH	Sn%
1 - IPJ Feed	57	4.3
12 - IPJ Final Cons	9	25-30

Overall Plant Process Flow Diagram



# Case Study

Modular construction in remote areas solving safety, power and water challenges

## SEDGMAN

Company name  
Sedgman

Sedgman is the leading provider of integrated minerals processing solutions. Since 1980, Sedgman have advanced the standard of excellence and innovation in design, delivery and operations for clients. Their Australian heritage has turned into a legacy of projects around the world, and they have expanded from their early days in coal to today, where their expertise includes iron ore, precious and base metals, lithium, potash, soda ash, and industrial minerals. Sedgman actively uses data and knowledge gained across four decades, hundreds of processing and materials handling projects, and

numerous countries to deliver reliable solutions for their clients. They are also known for the ability to successfully transfer technologies and innovative techniques across commodities.

## Customer description

The Byerwen mine project continues Sedgman's long history with Q-Coal Group. Since 1989, Q-Coal Group has been an independent Queensland-based company that has been active in the Queensland Resources Sector. The Byerwen plant produces a steel-making coal and a thermal coal product, maximising the value obtained from the resource. Sedgman was involved in multiple stages of the facility design and construction, including the train load out facility, stage 1 and 2 processing facility scopes, and a recent tailings dewatering facility. In addition, Sedgman supports Q-Coal Group through operations services for the facility.







### Problem

Q-Coal Group approached Sedgman to address a series of challenges at their Byerwen project, an open cut mine in the Northern Bowen Basin, Queensland. Minimising construction timeframes, ensuring the safety of construction teams, and minimising capital costs were drivers towards modular construction for this site. Logistics and safety challenges are even more pronounced for projects which are remote and do not have local skilled workforces. In addition, project challenges included minimising power and water usage.

### Solution

Sedgman's multidisciplinary engineering and project delivery teams worked together to address the outlined challenges. Cost, schedule and safety drivers were met through their modular construction approach.

For both stage 1 and stage 2 processing facility construction, all structural steel was fabricated off site, where their team managed the fabrication process, ensuring a high-quality product was manufactured to the required quality standards and securely loaded and transported to Australia. Sedgman's trusted preassembly subcontractor completed the assembly of modular steelwork including the installation of mechanical and electrical equipment with other components at the Mackay preassembly yard and delivered to the Byerwen mining site. By using an innovative modular design, they significantly reduced construction cost, onsite workforce numbers and overall project duration. Modular construction significantly reduces safety risks through lower on-site construction hours, and reduced working at heights. The reduction in construction schedule timeframes also supported faster time to initial

production. Staged expansion also allowed improvements to design when the processing facility was later duplicated.

Excellent safety outcomes were achieved in the tailings dewatering project scope, with Sedgman's deployment of the self-perform construction workforce, which provides their clients the benefits of reduced project cost, high safety standards and culture, excellent quality and productivity through an experienced construction workforce familiar with Sedgman design and procedures.

To address the power reduction challenge, the modular facility design was based on maximising use of gravity in the processing circuits, to reduce power usage.

One of Sedgman's key services is tailings dewatering, which maximises water recovery, and reduces the likelihood of environmental harm associated with tailings dams. In 2022 Sedgman delivered an engineering, procurement and construction contract of a new tailings dewatering facility at the Byerwen mine. This project converted the existing wet rejects pumped co-disposal system to a combined dry tailings and coarse reject trucked system. The new system is an integrated element of the Byerwen mine expansion and results in a lower operational risk profile, less power usage and improved water recovery and management of dewatering chemicals.

### Results

**Reduced construction timeframes:** For the first facility built, modules were lifted into place within eight days.

**Excellent safety outcomes:** The modular construction of the processing facilities was executed with zero lost time injuries.

**Power and water:** The new system is intended to result in a lower operational risk profile, less power usage, and improved water recovery and management of dewatering chemicals. Compared to raw water usage prior to installation, the Byerwen dry tailings design is predicted to save around 1.2 million cubic metres of water per annum – equivalent to 492 Olympic swimming pools.

### Contact

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## Case Study

Progressive land rehabilitation delivering industry-leading outcomes

## THIESS rehabilitation

### Company name

Thiess Rehabilitation

**Thiess Rehabilitation offers comprehensive mine rehabilitation services for sites of all sizes, commodities, requirements, and lifecycle stages. Delivered by miners with environmental expertise, their services include progressive mine rehabilitation, mine closure, infrastructure removal, abandoned mines, and contaminated land requirements. Thiess Rehabilitation has industry-leading capability in environmental and civil engineering, landform design optimisation, advanced surveying, asset management and maintenance.**



### Customer description

MACH Energy Australia's Mount Pleasant Operation. Mount Pleasant Operation is a recently established high-quality coal mine in the Hunter Valley, New South Wales.

### Problem

The site is very close to the town of Muswellbrook, and the project has some of the most stringent environmental requirements in New South Wales. Progressive rehabilitation from the beginning of the project, ongoing community engagement and delivering exceptional environmental outcomes has been critical to the project's success.

### Solution

Thiess Rehabilitation progressively rehabilitated 60 hectares of land at Mount Pleasant Operation from the beginning of the mine's operations. Focused on mirroring original native local habitat and creating enduring environmental value to the client and the community, Thiess Rehabilitation incorporated more than 354 habitat features into the landscape.

Working closely with the client, the team adopted a fluvial geomorphic landform design to ensure long-term stability against erosion and build the foundation to establish self-sustaining ecosystems post mining.

The team identified areas where rehabilitation could connect more closely with the broader landscape and worked to create wildlife corridors to facilitate the movement of fauna. This work included planting trees with hollows, creating land crevices and scattering loose bark and large branches to create a natural habitat for native species.

The design outcomes met end-of-land-use objectives, complied with regulatory obligations and addressed long-term closure requirements.

This tailored solution met their client's needs and enabled them to optimise the rehabilitation design, reducing their operating costs without compromising quality.

It also informed their approach to use ejector trucks to haul and place topsoil and tailor seed mixes to better suit the final landscape, including areas with increased stabilisation requirements.

### Results

The rehabilitation processes undertaken at Mount Pleasant Operations have been recognised as industry-leading by the NSW Resource Regulator.

The first rehabilitation campaign was delivered two months before the first coal was mined and seven months before the first coal train was loaded.

The resulting open, grassy woodland, with native grasses, trees and shrubs, incorporates connected habitats that create wildlife corridors with the surrounding landscape, encouraging the return of local fauna.

In particular, the geo-fluvial, natural landform, including contours, peaks and valleys, looks less engineered and more visually appealing, with better long-term landform stability.

**Contact**  
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## Australian METS Capabilities The Small Footprint Mine

	Agile and modular mine design	Precision mining technologies	In-situ recovery techniques	Low-impact processing methods	Green mining practices	Ecosystem restoration	Biodiversity conservation	Land reclamation
Australian Crushing & Belting Group	●	●						
Concept Environmental Services	●	●	●	●				
Dynamics G-Ex					●			
Earth Technology		●						●
Fleet Space Technologies	●				●			
Gekko Systems	●			●				
GeoMoby	●	●						
Glencore Technology	●			●				
Globo Hydro Power				●	●			
Lightning Protection International		●			●			
Mineral Technologies	●		●	●	●			
OffWorld Australia	●	●			●			
Owen Custom Products		●						
Real Time Instruments (RTI Australia)	●	●	●	●				
RemBind			●	●	●			●
Sedgman	●			●				
Southern Innovation		●		●				
SpaceDraft				●		●	●	●
Thiess Rehabilitation	●	●	●		●	●	●	●
Undercon	●			●	●			
Xenco Services					●			●

# Sustainable Mining: The Waste Free Mine



In the global drive to efficiently extract minerals from ore bodies more sustainably, mining companies are increasingly focused on waste reduction techniques and technologies.

Australian METS companies have developed a range of technologies and practices to reduce waste from the mining process and re-use it to create valuable new products and materials.

Deep orebody knowledge, cutting-edge ore sorting techniques and in-pit crushing and conveying have been utilised to remove waste from the mining process, eliminating the issue at its source.

To combat current waste challenges, innovative methodologies have been implemented to turn millions of tonnes of mine tailings and waste rock into valuable materials such as green cement, bricks, ceramic products and road bases. This has opened new markets and revenue streams for mining organisations.

Advanced processing technologies have then been deployed to recover valuable resources and critical minerals that were previously identified

as uneconomic, alleviating tailings challenges and making the most of the materials that have already been extracted.

Australian METS companies are promoting a waste free mining industry and adopting smart procedures to promote circular economy models in the mining industry. They offer expertise such as advanced resource recovery, repurposing of waste for construction materials, waste disposal and best practice tailings management.

### Key business capabilities:

- Waste-to-energy technologies
- Waste-to-construction materials processes
- Sustainable waste management practices
- Tailings management
- Resource recovery and reuse
- Circular economy models for mining
- Waste disposal and remediation

# Case Study

Innovative technology for recovery of metal from low grade resources



**Company name**  
Core Resources / Core IPEX

Core Resources is a specialist developer of processes and technologies for the clean and sustainable production of minerals, with a focus on the critical minerals that will be essential for the world's energy transition. Core has a partnership with South African technology company IPEX to further commercialise innovative hydrometallurgical technologies used for the recovery of metal values from low grade resources.

### Customer description

A major primary vanadium producer in South Africa.

### Problem

Development and implementation of new technology to recover valuable metals from low-tenor leachates from vanadium calcine dumps. In addition, the development of improved purification methods to produce high purity end products, such as electrolyte for Vanadium Redox Flow Batteries (VRFBs), at a competitive price.

### Solution

Core IPEX implemented their novel ion exchange technology to recover valuable metals from the low-tenor leachates at vanadium calcine dumps. Ion exchange is a process typically used extensively in the wastewater industry that has wide ranging applications in the mining industry to recover valuable metals from solution.

The principle of ion exchange for mining applications is that certain dissolved metals in solution can be selectively recovered onto a targeted resin over other dissolved elements in solution. The recovered metals can then be stripped off the resin by contact with acid or



alkali to generate a concentrated, purified, metal solution stream for further processing to saleable products.

### Results

Core IPEX's novel ion exchange technology initially produced vanadyl solutions at around 99.6% grade. Impurity levels were further reduced by upgrading equipment used for cycle transition rinsing which achieved >99.9% purity levels. Complete demineralisation of process water

further reduced impurity traces to deliver vanadyl sulphate solution of close to ultra-pure "four nines" (~99.99% grade).

This premium quality electrolyte is produced at significantly lower costs compared to conventional processing alternatives.

### Contact

[www.coreresources.com.au](http://www.coreresources.com.au)  
[rcoleman@coreresources.com.au](mailto:rcoleman@coreresources.com.au)



## Case Study

### Restoring evaporation pond storage capacity



#### Company name

**Geofabrics Australasia**

**Geofabrics works to protect, contain and secure the physical environment using smart geotextile and geosynthetic products. For over 40 years, Geofabrics has been helping clients mitigate environmental risk through world leading research and innovative product development in key infrastructure sectors such as mining, waste & containment, road, rail and defence.**

#### Customer description

Kestrel mine, located in Central Queensland is one of the world's largest metallurgical coal mines, producing around 7 million tonnes of metallurgical coal annually. Since 2018, Kestrel Coal Resources has operated the mine and is supplying coal to key markets around the world to be used in the steel making process. The company was awarded the Australian Mining Monthly (AMM) Mine of the Year in 2019 with its capabilities covering the entire mining process, from development to extraction and processing, environmental management, and sustainable rehabilitation.

#### Problem

The primary objective was to restore the storage capacity of the existing evaporation ponds at the Kestrel mine site. Prior to dredging, the HDPE lined evaporation pond had accumulated coal fines as a result of the site waste disposal process. This resulted in limited storage volume available to facilitate the evaporation of the effluent. Due to

the consolidation and location of the solids within the pond, the slurry was considered to be too wet to remove with excavators.

#### Solution

Geofabrics' Geotube Dewatering containers are a passive means to dewater and dry sludges without significant capital expenditure, which can be typical of mechanical dewatering methods. In this case Geotube units were selected and used to capture dredged solids and dry them to a spadable consistency.



Containers are deployed on site within an available footprint to capture and dewater sludge in a confined footprint compared to open-air drying. Exposing dried coal to weather in drying beds could lead to less control over the spoil and an increased risk of re-saturation during rainfall events.

Geotube dewatering provided the client with a cost-efficient solution for drying solids on site allowing the dredging operator to pump and operate at extreme flow rates that were congruent with their dredging equipment. This meant less time on site and less labour costs. In comparison, mechanical drying methods tend to slow the pumping operations, or alternatively multiple mechanical systems are needed to keep up with typical dredging equipment.

### Results

The solid within the pond was hydraulically re-saturated into a slurry and pumped into the Solmax Geotube® dewatering container.

25 Geotube containers measuring 18m wide x 30.6m long were deployed on site and were used to dewater approximately 20,000 m3 of coal fines, with each Geotube container holding approximately 850m3 of coal fines. Pumping fill heights were approximately 2.3m, with Geotube units settling to approximately 1.6m once dried and after passively weeping.

Commonly flocculants are introduced with fine solids when dewatering, but in this case was avoided due to cost. The decision was made to introduce floc to improve dewatering performance toward the end of the project. These flocculants assisted with maximising solids retained, promoting rapid solids separation and dewatering, mitigating the risk of clogging, and ensuring high-quality filtrate clarity from Geotube. As a result, the bags reached their maximum fill heights more gradually, signifying the effective filtration and drying properties of flocculated solids. Consequently, the labour involved in managing flows was also reduced. The flocculated Geotube containers provided greater consistency in final fill heights, allowing the stacking of bags if desired and when properly configured.

Geotube provided the client with the most cost-efficient solution for drying solids on site with consideration to the high flow rates from the dredge.

### Contact

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## Case Study

### Reducing waste and water from tailings dams



**Company name**  
**Phibion**

**Phibion is a Tailings Management Technology and Service provider using advanced in-situ mechanical dewatering technology.**

**Phibion's vision is to make tailings dams safer, smaller, and more sustainable.**

### Customer description

Lynas Rare Earths – Mount Weld Mine is a rare earth mine and processing refinery at Mt Weld, 750 km north-east of Perth, Western Australia. This mine is globally recognised as one of the world's premier rare earth deposits.

### Problem

In the early days of production, the Mt Weld tailings, comprising gangue minerals, unrecovered rare earth minerals and water from the rare earth flotation process, didn't settle and consolidate, leading to the rapid filling of tailings storage facilities, stability issues, and need for an expanding tailings footprint.

Established technologies were not suitable due to a combination of capital expenditure, operational cost, and technical risk. An alternative solution was needed to solve the mine's tailings management challenges.

Lynas sought assistance from Phibion to provide a bespoke tailings solution to manage the unique rare earth tailings properties.

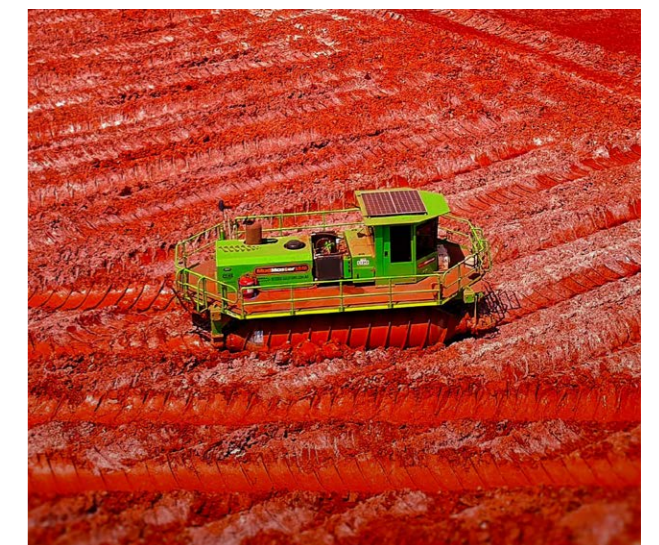
### Solution

Phibion employed its leading-edge tailings management technology using Accelerated Mechanical Consolidation (AMC™) and its MudMaster® dewatering equipment.

AMC™ Process:

- Tailings placed in layers.
- MudMaster® ploughs layer from the point of deposition to the point of water recovery.
- Water is forced to the surface, collecting in scroll tracks and draining to water recovery point, where it can be recycled.
- Process repeated in a cycle until target density or strength achieved.
- New tailings layer is deposited and process repeats.

The International Aluminum Institute has selected Phibion's solution as one of the best available technologies to manage tailings or residue of bauxite and alumina processing.



Mudmaster®

## Results

The implementation of AMC™ has been transformational. Improvements to the tailings operations include:

- A 50% reduction in tailings volume that needs to be stored.
- A 100% increase in the maximum tailings density that can be achieved (from 0.65t/m<sup>3</sup> to 1.2t/m<sup>3</sup>).
- An increase in the shear strength to over 30KPa (which supports load bearing machinery for rehabilitation and closure).
- The tailings storage facilities filling at a significantly reduced rate, complying with regulatory approvals.
- 70% water recovery.

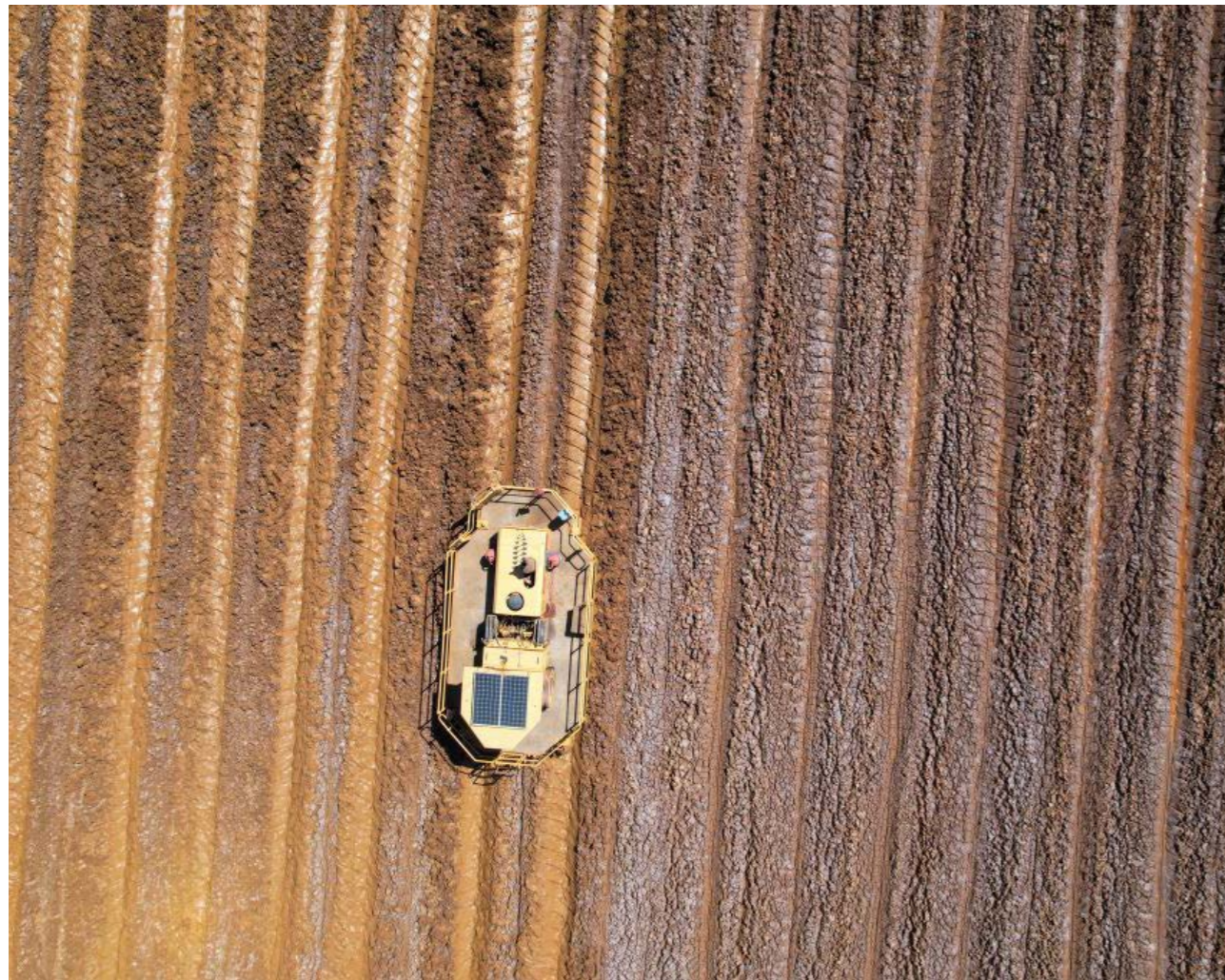
This performance rivals what can be achieved using filtration/centrifugation technology without the capital expenditure, without the time required

for full implementation and with less than 50% of the energy demand, while significantly reducing carbon generation.

With the significant increase in final tailings density, this led to the unusual metric of zero net increase in stored tailings volume for 3 years, even with continuous tailings deposition.

### Contact

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# Australian METS Capabilities

## The Waste Free Mine

	Waste-to-energy technologies	Waste-to-construction materials processes	Sustainable waste management practices	Tailings management	Resource recovery and reuse	Circular economy models for mining	Waste disposal and remediation
Antrak Logistics			●		●		●
Australian Crushing & Belting Group				●			
BeyondLOM	●	●	●	●	●	●	●
CDS				●			●
Clean&Recover			●	●	●	●	●
Core Resources					●		
Dynamics G-Ex		●	●		●		
Earth Systems	●		●	●	●	●	●
Geofabrics Australasia			●	●	●		●
Glencore Technology	●		●			●	
Green Eco Technologies							●
Hanson Australia		●	●		●	●	●
K2fly				●	●		
OLEOLOGY				●	●	●	
Peats Group			●		●	●	●
Phibion			●	●	●		
Pitcrew AI					●		
Real Time Instruments (RTI Australia)			●	●			
RemBind		●	●	●	●	●	●
Scantech International		●			●	●	●
Southern Innovation			●	●	●		●
Worldpoly				●	●	●	●
Xenco Services			●	●		●	●

# Australian METS Listing

## 3ME Technology

3me.technology  
info@3me.technology



3ME Technology is an Australian battery and heavy-electric-vehicle technology company based in Cardiff, NSW. They design and manufacture safe, energy-dense, lithium-ion battery systems that power mining and defence equipment. 3ME's battery technology enables their mining customers to replace diesel-powered vehicle fleets with cutting-edge electric battery systems, providing advanced safety features and reliability, reducing emissions, improving underground air quality, and supporting safer, more efficient mine operations.

### Value proposition

3ME Technology is a sovereign systems integrator and has built a capability to design, manufacture and integrate battery systems into mining, military and marine platforms. It has current and future capabilities across battery systems, systems integration, remote cyber-secure asset monitoring and in-field support. 3ME Technology provides an end-to-end capability in off-highway electrification to resources and defence. At the heart of their mission lies the elimination of diesel particulate matter in underground mining environments. They reduce emissions attributed to diesel-powered vehicles while concurrently optimising operations through the adoption of electric motors. With reduced maintenance needs and fewer moving components, their innovative solution propels the mining industry towards a cleaner, more efficient future.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

## Ampcontrol

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Ampcontrol is challenging the future by solving the most complex problems in energy. Ampcontrol creates energy solutions of scale using innovation partnerships, smart people and advanced Australian manufacturing. Their vision is to lead the global energy revolution and make net zero a reality. Every day, the world-first innovations from Ampcontrol help and support customers in all industries to decarbonise. With a proven track record of award-winning innovations and 55 years of developing custom energy solutions, Ampcontrol is trusted by customers worldwide to future-proof their business.

### Value proposition

Ampcontrol is unmatched in their track record of high-quality custom solutions and is helping and supporting its resource customers to decarbonise with net-zero innovations.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

## Antrak Logistics

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Antrak Logistics is a global leader in international transport and logistics services, catering specifically to the provision of services for large mining and industrial projects. Antrak draws from the extensive experience of their personnel, the resources of their global network, and deep understanding of project transport and logistics services to provide customised solutions that meet clients' requirements, with a focus on cost-effective, safe, and on-time delivery of all cargo. Antrak's commitment to their Continuous Improvement Charter and service optimisation reflects their goal of providing the highest level of expertise in all facets of project transport and logistics operations.

### Value proposition

Antrak Logistics, with Bolloré Logistics as its parent company offers a comprehensive value proposition for mining customers. Their low carbon transport plans include network optimisation, load consolidation, and efficient transport choices and are supported by carbon footprint reports, aiding in emission reduction strategies. Antrak actively collaborates with subcontractors to develop alternative energy shuttle services. Continuous improvement plans align with cost, deadline, and CO2 reduction goals. While exact percentages depend on specific client logistics, Antrak can potentially achieve significant CO2 reductions through mode switching, multi-modal solutions, and alternative fuels.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

### Secondary Sustainable Mining sub-sector

The Waste Free Mine

## Australian Crushing & Belting Group

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Australian Crushing and Belting Group (ACBG) is a comprehensive solutions provider to many heavy industries. They are known for expertise in crushing wear parts, spare parts, conveyor belt maintenance, and repair services. With a rich history spanning over two decades, ACBG has evolved into a trusted partner for clients across diverse industries, including mining, quarrying, construction, recycling, transportation, and defence.

### Value proposition

With select customers, ACBG work to improve their crushing wear parts via tailored engineering solutions. In one instance, they improved crusher performance by 177%, providing an additional 7 days of crushing in their site. More efficient crushing reduces energy and water consumption, can decrease material stockpile size and influence transportation requirements. ACBG also sources or produces very difficult to find crusher parts and equipment, particularly on older machines. This can result in significant improvements to the efficiency of existing crushing operations and materially reducing industry waste.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

### Primary Sustainable Mining sub-sector

The Waste Free Mine

## BeyondLOM

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BeyondLOM (Beyond Life of Mine) was developed to assist the mining and resource industry to meet the challenge of balancing economic return with sustainability. Through innovation and engagement, BeyondLOM aims to transform the mine life cycle into a concept that benefits investors, community and the environment alike. With a combination of passion, drive, first nation ownership in the business, extensive personnel experience and in-depth consultation, their team develops integrated solutions for new and existing mine leases. With a focus on the future of the industry, they help transition toward a mining model that maximises efficiencies and enhances sustainability during and beyond the life of a mine.

### Value proposition

BeyondLOM value adds to previous and existing mining operations by repurposing liabilities. For example, turning tailings into assets and hence generating new revenue streams for the miner and the community supporting it. Each site will have different opportunities. Engaging BeyondLOM and their ecosystem of specialist delivery partners ensures all viable options are put on the table with flexible implementation and commerciality.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

### Secondary Sustainable Mining sub-sector

The Smart Water Mine

## BITQ

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BITQ is a Data and AI Consultancy whose purpose is to make data useful. This encompasses reporting and analysis, data governance implementation, data strategy, data engineering, data visualisation and of course data science. BITQ has many years' worth of experience across the mining sector, with numerous mining clients throughout Australia.

### Value proposition

Transitioning to a data driven operating model, efficiencies are attained by leveraging the power of the data, not just in having the data. BITQ enables valuable outcomes that are derived from harnessing the power of the vast amount of data that exists within the typical mining companies' ecosystem. BITQ ensure miners stay ahead of the curve by creating data that enables miners to eliminate unnecessary functions, and more efficiently manage and report on their sustainability practices. Through partnerships with leaders in the software industry, BITQ ensures data engineering, business intelligence and data science is world- class.

### Primary Sustainable Mining sub-sector

The Community Mine

## Carbon Neutral

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Carbon Neutral helps businesses integrate strategies to mitigate the climate crisis. The carbon cycle and its effect on climate is complex. Their role is to provide a better understanding of what's involved and help clients implement simpler solutions to reduce their impact on the climate. They help with consultancy, assessments and reporting; buying carbon offsets, tailoring a carbon offset solution, project development services, and buying high volume carbon credits. They offer carbon management services to organisations across the globe, supporting a diverse range of clients from individuals and small businesses to large corporate emitters.

### Value proposition

Carbon Neutral provides the network support to help businesses integrate strategies to mitigate the climate crisis. They help businesses identify carbon footprint reductions customised for individual company strategy and scope in addition to providing carbon offset opportunities to help companies meet the UN Sustainable Development Goals.

### Primary Sustainable Mining sub-sector

The Community Mine

### Secondary Sustainable Mining sub-sector

The Zero Carbon Mine

## CDS

concretedatasensors.com.au  
info@concretedatasensors.com.au



CDS is a fully owned and operated Brisbane-based technology startup providing world class wireless data sensors to detect failures before they happen. CDS sensors use state of the art technology and AI to detect potential collapses so they protect people, property and assets.

### Value proposition

CDS sensors monitor water storage facilities to ensure that there is no loss of water through collapse and failures of the storage structure. The same system is used to monitor tailings storage. By stopping leaks and failures through monitoring, CDS sensors remove the need to import 30,000 litres of water by truck weekly per 50 million litres of storage under monitoring.

### Primary Sustainable Mining sub-sector

The Smart Water Mine

### Secondary Sustainable Mining sub-sector

The Waste Free Mine



## Clean&Recover

cleanandrecover.com.au  
luke.berry@cleanandrecover.com.au



Clean&Recover helps mining companies transform waste streams into productive assets. Their mission is to offer simple, dependable solutions that harvest value from mining wastes. They can help treat acid mine drainage, and extract valuable byproducts from mine waste.

### Value proposition

Clean&Recover's solution minimises the cost of treating acid mine drainage while delivering clean water and valuable byproducts from the drainage. The process avoids the use of chemicals such as lime or caustic soda.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

### Secondary Sustainable Mining sub-sector

The Smart Water Mine

## Concept Environmental Services

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Concept Environmental Services is one of Australia's leading providers of sustainable fluid solutions and renewable energy systems, offering environmentally sensitive solutions to the energy & resource, water and renewable energy sectors, specialising in remote, regional and urban applications.

### Value proposition

By truly understanding their clients' needs, and fostering the pioneering spirit of their teams, Concept Environmental Services delivers tailored products and services to help advance environmental sustainability resulting in 75% faster construction time than traditional methods.

### Primary Sustainable Mining sub-sector

The Smart Water Mine

### Secondary Sustainable Mining sub-sector

The Small Footprint Mine

## Core Resources

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Core Resources is a specialist developer of processes and technologies for the clean and sustainable production of minerals, with a focus on the critical minerals that will be essential for the world's energy transition. Operating world-class metallurgical laboratories and process engineering facilities, Core is renowned for innovation, and its client base is global.

### Value proposition

Core Resources develops innovative and sustainable solutions for complex metallurgical problems and uses its technical experience and expertise to test, design and engineer the recovery of critical, base and precious metals from new deposits and from mine waste.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

## Decarbify

decarbify.ai  
contact@decarbify.ai



Decarbify is a comprehensive carbon management software solution that processes and interprets collected sustainability data, providing predictive analytics and insights to help organisations make data-driven decisions.

### Value proposition

Decarbify is a one-stop platform connecting clients with various sustainability partners, products, and services. Decarbify helps to streamline carbon reduction initiatives by effortlessly finding, comparing, and purchasing carbon credits, offsets, and more, all designed to foster a sustainable future.

### Primary Sustainable Mining sub-sector

The Community Mine

## DGaS Services

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DGaS Services is a dangerous goods consultancy specialising in process safety management and facilitation of licensing and compliance for process facilities, major hazard facilities and dangerous goods locations.

### Value proposition

By working closely with miners to ensure the safe handling of dangerous goods and promoting responsible mining practices, DGaS helps mining companies build a positive reputation within the local community. This leads to better community relations, increased trust, and social licence to operate.

### Primary Sustainable Mining sub-sector

The Community Mine

## Dynamics G-Ex

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Dynamics G-Ex is an international geological supplies company, that focuses on ensuring smooth operation of reverse circulation and diamond drilling projects through manufacturing and supply capabilities. Its high-quality geological field and exploration products are trusted by top mining companies, geologists and field experts. Based in Australia, their reach extends worldwide, serving drilling programs across the globe. Their core strength lies in their collaborative approach to projects, enabling them to provide cutting-edge geological hardware solutions of the future.

### Value proposition

Dynamics G-Ex specialises in crafting the core processing facilities of the future, delivering environmentally sustainable solutions tailored to mining and exploration companies. Their commitment to innovation drives them to continually design and develop cutting-edge solutions for core and sample processing.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

### Secondary Sustainable Mining sub-sector

The Small Footprint Mine

## Earth Systems

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Earth Systems is a multidisciplinary environmental and social consulting firm, which develops and implements innovative and effective environment, water and sustainability solutions throughout the world. Established in 1993, they have successfully completed over 500 major projects in Australia, Asia, Africa, South America, North America and the Pacific. Earth Systems provides high quality services and solutions for the resources sector in the areas of environmental and social impact assessment, water management and treatment, ecology, energy efficiency, carbon accounting, community consultation and development.

### Value proposition

Earth Systems helps companies in the resources sector to create shared value through robust environmental and social management throughout the lifecycle of their projects. They also collaborate with companies, governments, communities and other key stakeholders on initiatives in a range of areas including innovation and technology development, technical assistance programs, policy development and advocacy to create a more sustainable global resources sector.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

### Secondary Sustainable Mining sub-sector

The Zero Carbon Mine

## Earth Technology

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accounts@earthtechnology.net



Earth Technology provides mining software solutions for all surface mining operations, proven over 25 years. Its unique 3D-Dig software simulates mining processes — excavation, transport and dumping — bucket-load by bucket-load. Using 3D simulation solutions for every mining operation ensures that mine plans run smoothly, before implementation.

The unique dump algorithm rapidly simulates multi-stage dumps. This allows maximum material fit and transport efficiencies to be determined. Simulation modules can optimize allocation of waste to different equipment types. Post-mining topography is reshaped in 3D. Reshaping conforms to design slope criteria while balancing cut and fill. Further analysis minimizes transport distances from post-mining topography to the reshaped surface.

### Value proposition

Plan optimal rehabilitation of mined land through:

- Rapid reshaping with visualisation
- Optimal transport arrows
- Pumping ponded water
- Visualization tools

### Primary Sustainable Mining sub-sector

The Community Mine

### Secondary Sustainable Mining sub-sector

The Small Footprint Mine

## Elwa Energysavers

elwa.com.au  
info@emmconsulting.com.au



ELWA specialises in manufacturing and installation of energy efficient water heater units and LED lighting systems. ELWA were an early adopter of LED technology and have implemented hundreds of energy and cost saving LED upgrades for public, industrial, retail and residential sectors including schools, hotels, factories, high-rise apartments, car parks, public buildings and warehouses.

### Value proposition

ELWA's technology has resulted in approximately 70% energy saving and up to 5000 tonnes of carbon saving for some of their customers across various industries.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

## EMM Consulting

emmconsulting.com.au  
info@emmconsulting.com.au



EMM Consulting combines technical expertise with a deep understanding of big picture sustainable business strategy to deliver solutions that drive positive environmental, economic, and social impact while creating long-term value for their clients. They are a team of dedicated environmental professionals: scientists, engineers, planners, and strategic advisors who place innovation, collaboration and out-of-the-box thinking at the core of their approach.

### Value proposition

From the early phases of building a business case and understanding the feasibility of projects, EMM Consulting help clients identify environmental and social constraints and opportunities as well as to establish approval strategies and pathways. They collaborate closely with their clients, providing support throughout the entire mining process, from initial exploration and feasibility studies to developing closure plans that account for the rising demand from local communities and regulators to create a positive and enduring legacy after the mine has ceased operations.

### Primary Sustainable Mining sub-sector

The Community Mine

### Secondary Sustainable Mining sub-sector

The Smart Water Mine

## Envirosuite Operations

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Envirosuite (ASX: EVS) is a global leader in environmental intelligence. Through a unique combination of science and technology, Envirosuite delivers flexible solutions to address challenges of air and water quality, noise, and vibration, enabling industries to optimise their performance while making the world a better place through improved environmental performance. In the Mining sector, Envirosuite is actively delivering results for a wide range of customers, including Newmont, BHP, Vale, Glencore, Anglo American, Teck and others. They have been successful in supporting both production and environmental teams by optimising processes that help meet operational and environmental objectives.

### Value proposition

Envirosuite's world-leading end-to-end solutions are built around the power of prediction, with hyperlocal meteorological forecasting, proprietary algorithms, real-time data and actionable insights. Their software provides powerful capabilities that enable customers to make fast and responsible operational decisions. They aim to make the complex easy-to-use so that anyone in your organisation can make the right decision, at the right time to improve environmental and operational performance. Envirosuite solutions help mining operators to maintain environmental compliance, optimise operational efficiency, support TARP across diverse parameters, reduce safety risks, and demonstrate responsible operations, thereby fostering a social licence to operate.

### Primary Sustainable Mining sub-sector

The Smart Water Mine

### Secondary Sustainable Mining sub-sector

The Community Mine

## Evocra

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Evocra is an Australian owned water treatment company offering solutions to remove hazardous contaminants from often difficult to manage water sources to improve the quality of the water for reuse or release. Their solutions have a broad range of applications over many mining and other heavy industries to resolve complex water contamination issues, while providing improved water resource economics and sustainability.

### Value proposition

Treating Acid Mine Drainage (AMD) with the OCRA process enhances onsite reuse opportunities and reduces the costs of further processing for ultra-pure applications. This boosts downstream economic and environmental outcomes and reduces liability concerns. Often within a single process unit OCRA can remove contaminants such as metals, organics (biological & chemical) and other suspended solids as well as balancing acidity or alkalinity to neutral. OCRA reduces reagent consumption by 75%, in contrast to traditional lime addition methods. In addition, the OCRA process can recover economic quantities of metals, providing additional resources and adding to the economics of the overall site.

### Primary Sustainable Mining sub-sector

The Smart Water Mine

## Fleet Space Technologies

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Fleet Space Technologies is Australia's leading space company connecting the deep Earth to their constellation of small satellites to unlock mineral exploration in near real-time. ExoSphere by Fleet® is a first-of-its-kind system that combines satellite connected nodes, a constellation of low earth orbit satellites to discover critical resources at depth much faster than traditional methods and very low environmental impact.

### Value proposition

ExoSphere by Fleet® technology does not utilise explosives or dynamites for exploration activities, significantly reducing the impact on the environment. Their sensors listen to noise sources present in the environment, removing the need for disruptive methods or heavy machinery to image the subsurface. The amount of drilling is also significantly reduced as a result of the accurate 3D model that allows to focus in areas of interest and reducing the need for extensive drilling and excavation, making mining practices more environmentally friendly. In terms of productivity, the 3D subsurface models are generated in a matter of 5 days, up to 100x faster than traditional methods.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

## Galetech Australia

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info@galetechenergyservices.au



Galetech Australia provides consultancy services in renewables, ESG reporting and carbon reduction strategies to the active Australian renewable and mining sectors. With a strong foothold in the renewable energy sector, Galetech Australia excels in ESG reporting, Due Diligence, Project Management, Grid Advisory, Planning, and Permitting services. Their pragmatic approach to ESG advisory and reporting empowers companies to achieve their sustainability goals.

### Value proposition

Galetech Australia's value proposition for mining customers is rooted in a commitment to driving sustainability and ESG reporting within the industry. By harnessing renewable energy solutions, they offer mining operations the opportunity to significantly reduce their carbon footprint. Additionally, their integrated approach not only contributes to environmental goals but also leads to tangible goals in operational performance. Galetech Australia understands the importance of ROI for their clients, and their solutions are designed to deliver compelling ROI, aligning financial success with sustainable practices and ESG objectives.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

## Gekko Systems

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gekkos@gekkos.com



Gekko Systems is a global leader in mineral processing, providing fully integrated solutions to mining companies around the world. Over the past 25 years, Gekko has developed strong capabilities in the design, manufacturing, installation and commissioning of energy efficient mineral processing equipment and complete plants for a wide range of minerals including gold, silver and polymetallics. The company also offers on-site performance consulting services for customers looking to optimise established process plants and achieve the highest operational performance. Gekko's range of solutions offer value for remote and environmentally sensitive operations with high energy costs.

### Value proposition

Innovative modular designs, elegant systems and smart manufacturing positions Gekko as a world technical leader in gold processing and low-energy mining solutions with a small footprint.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

### Secondary Sustainable Mining sub-sector

The Zero Carbon Mine

## Geofabrics Australasia

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Geofabrics is Australia's Geosynthetics specialist. They help clients deliver and maintain their infrastructure by minimising their risk and increasing their value through the innovative use of geosynthetic products.

### Value proposition

Geofabrics' aim within mining is to reduce cost of tailings dam closures, reduce maintenance of civil infrastructure through geosynthetics, and maximise life of containment and lining systems through site-specific performance testing and analysis.

Through its role in dewatering tailings sludge, sediment and waste can be reprocessed, reducing mine waste economically.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

## GeoMoby

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GeoMoby uses geofencing and BLE technologies to bring safety and efficiency to the workplace. It has a particular focus on environments exposed or subject to dangerous situations, such as remote sites with low connectivity, and underground. With a committed focus on R&D over the last 10 years, GeoMoby now offers a unique technology that enables companies to visualise people and assets in real-time in complex environments. Their carrier-agnostic platform allows companies to visualise their people and assets with high-precision detection with an accuracy of a few meters. GeoMoby's solutions function seamlessly in outdoors, indoors, and underground environments.

### Value proposition

World first, patented, underground, real-time location and communication system, using portable and re-deployable battery-powered nodes and BLE technology that is fast to deploy, scalable and cost effective with proven ROI within 12 months. Cost per meter is cheaper than all comparable options, however the patented solution has no direct competition.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

### Secondary Sustainable Mining sub-sector

The Community Mine

## GHD

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GHD is a global professional services company that leads through engineering and architectural skills and experience. Their forward-looking, innovative approaches connect and sustain communities around the world. Delivering extraordinary social and economic outcomes, they are focused on building lasting relationships with their partners and clients. Established in 1928, GHD remains wholly owned by their people. They are 10,000+ diverse and skilled individuals connected by over 200 offices, across five continents – Asia, Australia, Europe, North and South America, and the Pacific region.

### Value proposition

GHD understands both the business and technical issues involved in delivering optimum mining project outcomes. They consider the geological, geotechnical, mine planning, plant selection, mine infrastructure, tailings, environmental management, operational requirements and financial aspects of mining to address the many conflicting objectives in mine development. They provide strategic advice aimed at maintaining effective operations across the mine life cycle, from resource identification to site rehabilitation to decarbonisation strategies.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

## Glencore Technology

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mike.hourn@glencore.com.au

## GLENCORE TECHNOLOGY

Glencore Technology is an Australian based global supplier of world class technology in the minerals processing and metals refining parts of the mining value chain. They are focussed on bringing the safest and most efficient processing technology to their client partnerships, to help them solve the complex problems faced in modern mining.

### Value proposition

Glencore Technology's Jameson Concentrator technology reduces the footprint and height of a flotation concentrator by over 50%, with commensurate savings in input materials and carbon footprint. This groundbreaking technology also uses less than half the power of a conventional concentrator, further reducing the operations carbon footprint.

Their IsaCycle E-Waste technology allows the efficient processing of electronic waste without the complex sorting technologies that hinder other technologies. The IsaCycle submerged lance furnace can co-process a broad range of other wastes, such as municipal wastes, along with E-Scrap, providing a unique benefit to clients and the communities in which they operate.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

### Secondary Sustainable Mining sub-sector

The Waste Free Mine

## Globo Hydro Power

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Globo Hydrogen Power™ (GHP™) is an industry-leading fuel enhancement system which is installed into trucks, buses and power generators to upgrade traditional petrol and diesel engines into cost-saving, emissions-reducing, hydrogen hybrid engines.

### Value proposition

The GHP™ process helps fuel burn more efficiently during the combustion process of an internal combustion engine, which generally operates at 52 – 58% burn efficiency. With internal combustion alone, 42 – 48% of fuel is left unburnt following combustion proceedings, which is released into the atmosphere as pollution through an engine exhaust system.

Upgrading a traditional engine into a hydrogen hybrid engine allows fossil fuel and hydrogen to jointly run an engine. Fuel savings and negative greenhouse gas emissions reduction are realised as the more expensive petrol or diesel is replaced with cheaper hydrogen. Hydrogen utilised in a gaseous state easily enters into the air intake of an engine without the need to change engine sensors to accept hydrogen. Engine sensors accept hydrogen gas as hydrogen is an already present chemical within fossil fuel "Hydro Carbon Fuel".

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

### Secondary Sustainable Mining sub-sector

The Small Footprint Mine

## Green Eco Technologies

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hello@greenecotec.com



Green Eco Technologies' WasteMaster is an Australian owned and made technology that converts putrescible waste to a concentrated residue within 24 hrs. Independent testing has shown that their residue destroys pathogens and bacteria such as E Coli, Salmonella and Listeria with virtually no odour and does not attract rodents. The residue can safely be handled, transported, stored and used via an anaerobic digester system which produces biomethane. This in-turn is used to generate renewable electricity or as an additive to create a high quality fertiliser and compost through partners.

### Value proposition

Utilising a WasteMaster to recycle food and putrescible waste at mining camps can not only significantly reduce the environmental footprint of food waste but will recognise double digit percentage reduction in costs. For example, a current customer with a very remote site produces approx. 2,000kg of food waste per day. By installing WasteMaster's on-site to recycle food waste, instead of transporting it hundreds of kilometres to a landfill site, they have reduced the cost of this waste by 40+% and reduced the CO2e emissions from their food waste by 84%, which in this case equates to more than 1500 tonnes per annum of Green House Gases.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

## Green Gravity

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info@greengravity.com



Green Gravity is an innovative, Australian based, clean technologies company focused on repurposing legacy mines into energy storage hubs. Green Gravity has developed a technology that utilises heavy objects moving vertically through legacy mineshafts to exchange electrical and gravitational potential energy.

### Value proposition

Green Gravity's energy storage technology repurposes redundant assets and disused mine shafts, offering a cost-effective, environmentally sustainable solution for the transition to renewables and improved mine closure prospects. Using proven mechanical components, it ensures long-life performance with no chemical processing or degradation. Vertical weight movement provides high Round Trip Efficiency, while repurposing existing structures aligns with circular economy principles. The modular design fits various locations, with mid-sized shafts providing 5MW/25MWh capacity, extendable to 60-100+MWh in deep shafts. Competitive costs and a 50-year infrastructure lifespan make it transformational for grid stability, reduced transmission costs, and emissions reduction, supporting renewables and local community energy initiatives.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

## Hanson Australia

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Hanson is a leader in building and construction materials with an extensive production and logistics network across Australia. Hanson is part of the Heidelberg Materials Group, which has over 51,000 employees at almost 3,000 sites in over 50 countries. Heidelberg Materials is a front runner on the road to carbon neutrality and circular economy in the building materials industry, working on intelligent and sustainable building materials as well as solutions for the future.

### Value proposition

Hanson supplies a comprehensive range of high-quality concrete, aggregates and sand, and also produces road base, asphalt and sustainable and recycled construction materials for civil construction and infrastructure projects.

Heidelberg Materials has committed to:

- Generate 50% of revenue from sustainable products by 2030.
- Reduce CO2 emissions to 400 kg CO2/t CEM by 2030.

The Hanson Australia business is working to meet these targets by 2030.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

### Secondary Sustainable Mining sub-sector

The Zero Carbon Mine

## Hydro Australia

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Hydro Australia is an engineering company service centre in Hydro's worldwide pump service organisation, which services all pump brands. Hydro provides quality engineering, pump rebuilding and on-site field services to users in Australia, New Zealand, Vietnam, and South-East Asia. Hydro services clients from a range of sectors, including Mining, Oil & Gas, Defence, Power & Utilities, Councils and Agriculture.

### Value proposition

Hydro's focus is on reducing the client's energy costs whilst improving pump efficiency, and to achieve this goal, Hydro Australia offers Wireless Condition Monitoring on pumps and laser scan reverse engineering.

### Primary Sustainable Mining sub-sector

The Smart Water Mine

## K2fly

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K2fly creates value for resources companies and their stakeholders in an increasingly transparent world. Their software delivers results to assess and manage corporate ESG risks globally from operational to executive level, ready for disclosure to all stakeholders.

### Value proposition

k2fly's solutions improve governance across natural and mineral resources, proven to automate otherwise manual processes to increase process efficiency by as much as 5-10%, which can represent tens of millions per mine in savings and increased revenues. Their solutions are not only required to ensure clients are disclosing accurate information to their stakeholders but also optimise the complexities of the reporting process.

Resource Governance provides assurance that a mineral resource project will meet stakeholder and broader society expectations for stewardship and management of natural resources.

### Primary Sustainable Mining sub-sector

The Community Mine

### Secondary Sustainable Mining sub-sector

The Waste Free Mine

## KiTech Hydrogen Systems

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KiTech is a clean-tech company that uses its patented technology to manufacture electrolysed-based hydrogen systems designed for automotive & industrial applications. KiTech hydrogen systems, when used with IC engines, help achieve up to 50% fuel savings and up to 70% reduction in greenhouse emissions.

### Value proposition

KiTech's electrolysed-based hydrogen system technology can reduce carbon footprint by up to 70%, reduce fuel-consumption by up to 45%, earn carbon credits that can be traded for dollars, and can achieve ROI within 12 months.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

## Lightning Protection International

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LPI is a fully Australian-owned designer, manufacturer and supplier of innovative solutions in the areas of direct strike lightning protection, surge and transient protection, and earthing and bonding. They have extensive experience in handling projects in the most lightning prone areas of the world across all industry sectors, including mining. LPI also offers a full suite of professional consultancy services in lightning protection and earthing, and has contributed cutting edge solutions to Australian and overseas mining industries.

### Value proposition

Comparison between traditional lightning protection systems (LPS) and LPI's advanced LPS in terms of their carbon footprint reveals LPI advanced systems have three times less carbon footprint than traditional systems. Along with savings on installations costs, this technology makes a significant contribution to financial and environmental efficiencies.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

### Secondary Sustainable Mining sub-sector

The Zero Carbon Mine

## Liquid Integrity Systems

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Liquid Integrity Systems (LIS) provides leak detection, 3D seepage modelling, and high-resolution bathymetry with unparalleled capabilities.

Their custom hardware, software, and specialised geophysical techniques ensure that each survey is optimised for maximum sensitivity and accuracy. Our non-intrusive approach allows surveys to be performed at any time without interrupting operations.

### Value proposition

Each survey is customised to the site and is deployed for different reasons. LIS surveys offer unparalleled leak detection services, equipped for various environments including acidic, briny, and sludge-filled areas that are too challenging for conventional leak detection methods. Leveraging custom hardware, they guarantee no damage to geosynthetic liners and no need to empty storage facilities. Specialising in real-time data collection and precise georeferencing through RTK GPS, they efficiently identify leak signatures and provide daily updates and detailed results within a week. Prioritising safety, they utilise low voltages and remote equipment deployment, requiring no personnel to enter hazardous areas, abiding by ASTM D8265 standards. Following the results of their surveys, LIS can leverage their industry networks to assist in resolving any uncovered challenges effectively, facilitating optimal site management.

### Primary Sustainable Mining sub-sector

The Smart Water Mine

## Magnum Australia

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Innovative 50 year Australian supplier, designer and manufacturer of specialist water spraying and pumping equipment to mining that is specific to controlling dust, assisting washdown of equipment and production areas, plus aiding with fire prevention and management. Magnum Australia's products include full automation to bluetooth and ground speed control systems, customised attachments, tracked robots and full systems integration to almost all mining vehicles. Applications include surface, underground, hard rock or coal mining, with products sold and supported in over 65 countries.

### Value proposition

Increased product and operational efficiencies by up to 50% and demonstrating a reduction of carbon and wear costs by up to 35%.

Lower operational parts replacement costs, extended product working life and a return on investment in 18 months.

A wide attachment product selection customised to suit customer preferences using latest technologies for reduced startup or changeover costs to new and existing systems.

### Primary Sustainable Mining sub-sector

The Smart Water Mine

### Secondary Sustainable Mining sub-sector

The Zero Carbon Mine

## Mineral Technologies

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Working with customers in mining operations for over 80 years, Mineral Technologies delivers innovative, cost effective process solutions for Iron Ore, Mineral Sands, Silica Sands, Coal, Chromite, Gold, Tin, Tungsten, Tantalum and a wide range of other fine minerals worldwide. With teams located in North and South America, Brazil, India, South Africa and Australia, the company supplies a wide range of services and equipment from metallurgical testing and process flowsheet design, through to plant and equipment design, manufacture and supply, process audits, optimisation and plant delivery.

### Value proposition

All Mineral Technologies solutions are focused on adding value. Examples include:

Flowsheet development and proprietary separation equipment - developing circuits that maximise grade, recovery and revenue and minimise plant size and cost.

Engineering Design - designs including modular plants that can be fabricated cheaply in a workshop environment, installed quickly and relocated easily to extract value from both large and small deposits.

Mobile Mining Units - to replace truck and shovel fleets with a track mounted mining/pumping unit, significantly reducing the requirement for capital equipment, haul roads, operators, diesel and maintenance.

Lyons Units - A new, technology based surge bin/CD tank, these units provide a range of benefits including feed desliming and stabilisation, real surge capacity, stable operation at pumping densities up to 65% solids and beneficiation in some applications.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

## Minnovare

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Minnovare is an advanced technology company that specialises in improving the accuracy, reliability, and profitability of underground hard-rock drilling operations. Their advanced drill alignment hardware and data-capture software combines to deliver clients' drill-data faster and more accurately than ever before. This enables faster, smarter operational decision making. In January 2022, Minnovare joined the Hexagon group - a global leader in digital reality solutions, combining sensor, software, and autonomous technologies for a simple, yet powerful purpose: Putting data to work to empower an autonomous future. As part of Hexagon's Mining Division, Minnovare continues to provide innovative and world-class drilling technology solutions to clients across the globe.

### Value proposition

Three case studies showcase the transformative impact of Minnovare's solution on mining operations:

Aeris Resources saw remarkable outcomes, including a 62% reduction in dilution, \$32 million in additional profit from 119 previously uneconomical mines, and a 12.3% reduction in CO2 emissions, equivalent to sparing 6200kt of CO2 emissions.

Macmahon achieved increased stopping meters, improved average grade of tonnes mined, and an 87% reduction in slashing.

Northern Star experienced the power of 100 additional drill meters per day, a 17% increase in drilling productivity, a 3.5% reduction in stope turnover time, and approximately \$8.4 million in additional revenue.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

## MX3 Diagnostics

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MX3 Diagnostics is a Melbourne-based health technology company that specialises in non-invasive point-of-care diagnostics. MX3's customers include mining, construction, pro-sports, emergency services, and military groups who use their unique saliva-based hydration assessment technology to enhance their performance and safeguard against adverse events.

### Value proposition

More frequent and individualised hydration assessment, made possible with rapid saliva-based testing, can improve workplace safety and productivity. Automated logging of MX3 measurement data through the MX3 App and Portal allows for data to be easily summarised to generate insights into workforce hydration and demonstrate compliance with hydration management practices to regulators.

### Primary Sustainable Mining sub-sector

The Community Mine



## OffWorld Australia

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OffWorld is a private company that designs, develops, and manufactures AI-powered robotic platforms. OffWorld is reinventing the mining, manufacturing, and construction industries by developing a new generation of robot species that work together intelligently in a swarm capability to extract critical minerals and materials. The rugged robotic swarms can work efficiently, independently and together in an eco-friendly approach in extreme conditions – all while removing humans from harm’s way.

### Value proposition

The benefits include:

- Unlocking stranded and dormant mines through precision mining, minimal dilution and waste movement.
- Substantial Economic Value Creation via lower Capex and scalable Opex.
- Significant mine deployment benefits such as 26% revenue and reducing 18% operating cost.
- Removing workers out of harm’s way by fully operational autonomy.
- Enabling zero entry mining.
- Accelerating transition to net zero through electric equipment and eliminating the need for energy-intensive conventional machinery.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

## OLEOLOGY

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OLEOLOGY is an Australian wastewater engineering technology, treatment and processing company based in Perth. It has a track record of over 20 years of water treatment to remove contaminants and pollutants to regulatory and best environmental practice requirements from wastewater sources such as Mining, Oil & Gas, leachate, logistical supply bases, Marine and Industrial wastewater. OLEOLOGY clients include Chevron, BHP, Rio Tinto, Toll, Defence, Westrac, Cummins and Australian Antarctic Division.

### Value proposition

OLEOLOGY has been able to reduce water usage onsite for operations and non-processing infrastructure, with some sites achieving up to 50% reduction in usage. Further reductions in carbon footprint are possible by removing the reliance on Reverse Osmosis or chemical dosing by retrofit or replacement with a modular OLEOLOGY treatment system. Each solution, while achieving water compliance to the environmental regulator, has also improved maintenance and personnel time onsite. OLEOLOGY has proven benefits to reduce power consumption; reduce trucking costs, reduce waste, remove unnecessary personnel onsite and reduce environmental risk while creating reuse benefits.

### Primary Sustainable Mining sub-sector

The Smart Water Mine

## Opatrix

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Opatrix is an Australian technology company that creates innovative data integration and visualisation software valued by mining, heavy industry, infrastructure, and energy markets. By bringing together data from many different sources, then analysing and visualising this data, Opatrix allows clients to drive towards zero carbon through energy reduction and improved productivity.

### Value proposition

Many mining companies have gone down a digital path, but still do not have a ‘single source of the truth’ that presents all of their digital information in one place. ARDI, Opatrix’s data integration platform, allows clients to get a full digital view of their data. It brings all data together, where stakeholders from the field to the boardroom can use it to create value and insights, driving a range of improvements, including towards net zero carbon goals. ARDI uses AI and analysis to identify energy savings by interrogating energy use data. It combines energy data with other production and maintenance systems, models the introduction of renewable energy sources, and tracks energy usage over time as clients move to net zero.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

## Owen Custom Products

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Owen Custom Products designs and manufactures custom Swing Pedal systems predominantly for draglines both in Australia and internationally. These systems can be retrofitted to existing draglines or supplied as original equipment and/or replacement. Maintenance/repair services are also provided.

### Value proposition

Improvement in dragline productivity will realise an immediate reduction in costs and environmental impact. Improved swing pedal systems designed by Owen Custom Products negate the need to shut down draglines every few weeks to recalibrate, resulting in:

- An estimated dragline productivity improvement of approximately 4%, saving the typical Australian coal mine AUD 3 million per year; and
- Improved environmental impact through less transport, waste materials and emissions associated with shutdown maintenance activities.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

## Parvate ESG

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Parvate ESG is a forward-thinking ESG (Environmental, Social, and Governance) consultancy based in Perth, Western Australia. Committed to advancing Australian sustainability initiatives, their experienced team collaborates with diverse clients to navigate the intricate ESG landscape. They specialise in tailored strategies, regulatory compliance and proactive support, contributing to sustainable growth across various industries, including mining and METS. Parvate ESG proudly represents Australian expertise in fostering sustainability globally, with a growing presence in India and Singapore.

### Value proposition

Parvate ESG specialises in empowering sustainable growth within the mining and METS sectors. With a deep understanding of industry intricacies, they develop customised ESG strategies that seamlessly integrate with operations, enabling regulatory compliance and enhancing competitive advantage. Their focus is on forming sustainable partnerships, improving business performance, and delivering clear, actionable outcomes. They believe in providing practical solutions without unnecessary complexity, allowing clients to concentrate on their core business. Parvate ESG's proactive guidance and expertise helps navigate the evolving ESG landscape and secure a sustainable future for mining and METS.

### Primary Sustainable Mining sub-sector

The Community Mine

## Peats Group

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Utilising their renowned BiobiN technology alongside various other effective collection strategies, Peats Group has revolutionised organic waste collection and on-site processing facilities on a global scale. They are committed to fostering a sustainable future through innovative and eco-friendly waste management solutions, making a substantial positive impact on the community and the environment. Peats Group proudly serves as the primary processor of metropolitan Adelaide's green and food organics, sourced through a comprehensive network encompassing council kerbside and business collections, as well as partnerships with hotels, supermarkets, schools, office buildings, food processors, and manufacturers.

### Value proposition

Peats Group is the proud innovator behind the BiobiN waste management system. They empower businesses all over Australia, including those in remote mining areas, to self-manage their food waste and compostable materials efficiently on-site, eliminating the hassle and costs of off-site waste transportation and providing an environmentally friendly fertiliser for use in mine rehabilitation or local community projects.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

## Phibion

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Phibion is a wholly owned Australian Company with its head office in Brisbane, Queensland. They provide safer and more sustainable tailings and this is done by in-situ dewatering of the tailing storage facility. Phibion has a patented process called Accelerated Mechanical Consolidation (AMC) and uses the MudMaster machine to assist this process.

### Value proposition

- Increases density of the tailings by up to 20%
- Increases water recovery by 40%
- Reduces tailing dam volume by 50%
- Increases strength to 35 kPa
- Defers or negates capital expenditure by reducing future wall raises and extending the life of the tailings storage facility (TSF)
- Reduces the need for additional new dams and saves valuable green space

### Primary Sustainable Mining sub-sector

The Waste Free Mine

### Secondary Sustainable Mining sub-sector

The Smart Water Mine

## Pitcrew AI

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Pitcrew AI was born out of an inquisitive, engaged group trying to help customers succeed. They are experts in engineering, specifically computer vision and radiometric inspection. Pitcrew AI is shaping the future of mining and transport by enabling autonomous vehicle inspections and prognostics with real-time condition monitoring. Their automated, AI and thermography based assessments inspection system enhances safety, efficiency, and sustainability, while enriching human lives.

### Value proposition

Pitcrew AI enables cost savings through early identification of tyre injury or damage and increases tyre repair rates rather than disposal. They increase productivity through trucks having more availability and uptime, tyres staying operational longer, forecasting damage progression and optimising planning for tyre service. From a sustainability perspective, Pitcrew AI also helps to decrease tyre wastage.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

## PX4 Software

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PX4 is the only truly jurisdictionally specific tenement management software, allowing companies to demonstrate their compliance against statutory obligations. This cloud-based and intuitive system also tracks all agreement obligations and evidence of compliance, stakeholder communications and secondary permits / licences required for operation. PX4 is the single source of truth for tenements and all associated requirements.

### Value proposition

PX4 improves efficiency of tenement and approval management by up to 40%, with accessible, visible and auditable data. PX4 is a governance tool that streamlines approval management, with jurisdictionally-specific workflows providing better governance and certainty of ongoing compliance. PX4's Stakeholder Communications and Agreements Modules allow for better capture of community and stakeholder consultations. Through providing better visibility of obligations relating to land access, native title agreements and tracking disturbance and rehabilitation progress, PX4 ensures all obligations to the community are considered in decision making and that all relevant information is captured in a centralised source of truth.

### Primary Sustainable Mining sub-sector

The Community Mine

## Real Time Instruments (RTI Australia)

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In a world where real-time decision-making is crucial, RTI – Real Time Instruments is revolutionising bulk material handling with cutting-edge on-line measurement and analysis scanners. Since its inception as an instruments service provider to the Australian coal industry in 2004, RTI has grown and diversified into a global leader, manufacturing and supplying on-line elemental and moisture analysis scanners to the global mining, mineral processing, power generation, steel, cement production and food industries.

### Value proposition

RTI technology addresses a critical challenge encountered by bulk material handling operations across various industries, enabling operations to make informed decisions in real time, resulting in improved recovery, reduced waste, and enhanced operational control. Through their industry-leading analytics, RTI's customers consistently exceed revenue, yield and production targets while simultaneously decreasing their carbon footprint. The improved efficiency and stricter quality control measures enable customers to lower emissions, thereby contributing to their net-zero targets.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

### Secondary Sustainable Mining sub-sector

The Waste Free Mine

## RemBind

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RemBind develops remediation solutions for contaminated soil. RemBind's cornerstone powdered products bind up and neutralise environmental contaminants in soil, with a key focus on toxic PFAS chemicals that originate from fire-fighting foams, labelled the 'forever chemicals' because of their persistence in the environment. RemBind products have been used to treat thousands of tonnes of contaminated soil across North America, Europe, Australia, and New Zealand. RemBind works with a wide variety of civil and mining contractors worldwide to access the most suitable soil mixing technologies and will work alongside mining contractors to offer a range of treatment solutions for contaminated soils allowing safe onsite reuse or offsite disposal of treated soils.

### Value proposition

A Circular Economy approach encourages the reuse and regeneration of materials or products, especially as a means of continuing production in a sustainable or environmentally friendly way. RemBind's projects demonstrate how contaminated soils can be treated and reused at mine sites in a practical and safe manner, alleviating the need for unsustainable and costly remediation options such as landfill disposal. RemBind can demonstrate the onsite immobilisation of soil contaminants followed by the safe reuse of treated soils at site and how miners can leverage conventional mining equipment rather than specialised remediation equipment. In particular, the onsite management of soils containing PFAS contaminants can be a cost effective and practical solution for mine sites. RemBind's project experience will help to pave the way for the safe, sustainable and practical management of contaminated soils at mine sites, with an emphasis on the sustainable management of PFAS contaminants in soils.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

### Secondary Sustainable Mining sub-sector

The Small Footprint Mine

## RWDI

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RWDI is a Climate and Performance Engineering consultancy firm with a team of over 800 engineers, scientists and specialists. Their global and deep technical expertise helps clients overcome design and operational challenges to enable them to meet ambitious goals while maintaining the project's harmony with the natural environment. RWDI's expertise in the mining sector includes climate and meteorology, noise and vibration, dust and air quality, greenhouse gas, wind engineering and resiliency during planning and operational phases of the project. This expertise is supported through detailed modelling, monitoring and propriety software.

### Value proposition

RWDI is a climate and performance engineering consultancy firm supporting mining operators during planning and operations. RWDI's services include modelling and monitoring of noise, vibration and blasting, air quality, dust and greenhouse gas (GHG) emissions; and field services such as the directional BarnOwl noise monitoring system and SmartaData for remote monitoring. RWDI has also developed the CALPUFF-IDM (inverse dispersion modelling) approach to identify and quantify GHG area emission sources for open-pit mining operations to enable the development and validation of suitable abatement programs.

### Primary Sustainable Mining sub-sector

The Zero Carbon Mine

## Scantech International

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ScanTech is a world leader in supply of representative, continuous, real time measurement technologies for conveyed materials to the minerals sector.

### Value proposition

Digitalising conveyed flows has proven to increase ore grade by 5-20+% and remove 10-20+% waste through bulk ore sorting, which can save 10-20% GHG emissions and 10-20% tailings generation. It can also lead to short (weeks) paybacks through increased metal recoveries by reducing process feed variability. With ScanTech, some sites reduced CAPEX by 10-20% in plant construction through lower throughput, and utilising product quality bypass. Coal plant product quality bypass has a 2 month payback in wash plant cost savings.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

### Secondary Sustainable Mining sub-sector

The Zero Carbon Mine

## Sedgman

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Sedgman is the leading provider of integrated minerals processing solutions. Since 1980, Sedgman has advanced the standard of excellence and innovation in design, delivery and operations for clients. Their Australian heritage has turned into a legacy of projects around the world, and they have expanded from their early days in coal to today, where their expertise includes iron ore, precious and base metals, lithium, potash, soda ash, and industrial minerals. Sedgman actively uses data and knowledge gained across four decades, hundreds of processing and materials handling projects, and numerous countries to deliver reliable solutions for their clients. They are also known for the ability to successfully transfer technologies and innovative techniques across commodities.

### Value proposition

Sedgman's vision for a sustainable world includes mining and minerals processing done differently. Sedgman is engaging with innovative and systems-thinking partners to work across traditional scope boundaries to identify solutions that reduce emissions, tailing volumes, and net water usage. This transformation is supported by technical innovations across the industry, from reduced energy comminution, coarse flotation, early waste rejection and grade engineering, scalable modular solutions for adaptable processing, and opportunities for reprocessing and reuse of tailings. They can support technical evaluation of processing options from a green house gas and water use impact and capital and operating cost perspective, to support best for project, community and environment decision making.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

### Secondary Sustainable Mining sub-sector

The Smart Water Mine

## Sentient Computing

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Sentient Computing is an Australian software development company that specialises in providing powerful and immersive virtual environments to deliver solutions, including Digital Twins, blended training packages and other ESG communication solutions. Sentient's Digital Twin product InDI is a versatile virtual interface that can be procedurally generated from engineering models and leverages a company's existing data sources to provide a scalable and future-proof solution. It is currently helping hundreds of unique monthly users to better service their multi-billion-dollar assets. Software is supported by training packages which are scaffolded learning experiences that include interactive eLearning modules, custom VR training and interactive computer-based training. Sentient Computing help mine site personnel, utility providers, senior business leaders and local communities upskill both technically and professionally.

### Value proposition

Being able to share a common 3D model offsite, connected to data, significantly reduces travel to site, negates the need for training and monitoring in dangerous mining environments, increases speed of decision making and increases clarity of information through communicating with Sentient Computing global experts.

### Primary Sustainable Mining sub-sector

The Community Mine

## Southern Innovation

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Southern Innovation ('SI') is an advanced manufacturing company that develops, designs, tests and deploys sensing products for various commodities in the mining sector. SI has developed world-leading material analysis instrumentation, leveraging advanced photon science sensor technology and proprietary AI data processing algorithms. SI's experienced management team has a deep technical, scientific and commercial expertise, extensive industry relationships and a track record of successfully delivering complex technology development projects. Their primary business model involves collaborating closely with partners to craft customised solutions that apply advanced technology to novel operational parameters. Southern Innovation's products boast a flexible architecture, facilitating smooth integration into existing customer networks.

### Value proposition

SI's digital products improve the speed and accuracy of the analysis of minerals. This enables the deployment of high-speed, real-time analysis systems in mineral processing operations that dramatically improve process efficiencies and product yields.

Sensor-based ore sorting technologies have been identified as a way to increase grades and productivity, and reduce waste, water consumption, energy use and GHG emissions. SI's advanced sensors and algorithms remove the need for costly sampling and lab-based analysis and enable rapid and accurate decision making when applied to mechanised real time ore sorting or drilling.

Just one installation of SI's GradeScan units has demonstrated annual value in use exceeding \$60 million dollars.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

### Secondary Sustainable Mining sub-sector

The Small Footprint Mine

## SpaceDraft

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SpaceDraft is a revolutionary visual communication tool. It transforms conversations around mining by simplifying intricate processes through real-time visual mapping. Drawing inspiration from stage choreography, it helps people see a visual representation of plans before they happen, which enhances collaboration, optimises resources, and strengthens safety practices. Its user-friendly interface replaces traditional methods with dynamic visuals, offering drag-and-drop simplicity for intuitive learning on any device. SpaceDraft revolutionises visual and thoughtful communication, driving efficiency and empowering diverse teams in a swiftly evolving landscape. With real-time updates and language-agnostic features, it effortlessly bridges communication gaps helping all stakeholders to sing from the same song sheet.

### Value proposition

SpaceDraft provides a compelling value proposition for mining customers:

**Reduced Downtime:** A 40% reduction in total shutdown man-hours, saving up to \$1.872 million AUD in carbon emission value.

**Reduced Incidents:** Up to 30% reduction in incidents, leading to safer operations and lower costs.

**Reduction of Carbon Emissions:** 2,252.8 to 2,760.32 metric tonnes of CO2 emissions reduced, affirming an environmentally conscious approach. These quantified benefits showcase SpaceDraft's capacity to enhance operational efficiency, safety, and environmental stewardship, enabling mining companies to excel in a sustainable manner.

### Primary Sustainable Mining sub-sector

The Community Mine

### Secondary Sustainable Mining sub-sector

The Small Footprint Mine

## Thiess Rehabilitation

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Thiess Rehabilitation offers comprehensive mine rehabilitation services for sites of all sizes, commodities, requirements and lifecycle stages. Delivered by miners, who are also environmental experts, their services include progressive mine rehabilitation, mine closure, including infrastructure removal, abandoned mines, and contaminated land requirements. Thiess Rehabilitation has industry-leading capability in environmental and civil engineering, landform design optimisation, advanced surveying, asset management and maintenance.

### Value proposition

Thiess Rehabilitation offers comprehensive rehabilitation services for the mining sector for sites of all sizes, commodities, requirements and lifecycle stages. Since 2007 they have rehabilitated over 10,215 hectares. Thiess Rehabilitation offers a team with technical and operational expertise, backed by whole of-mine-life knowledge, and a full suite of rehabilitation services. This includes progressive mine rehabilitation, mine closure, including infrastructure removal, abandoned mines and contaminated land requirements. With access to a large asset base and strong balance sheet, and the ability to explore alternative commercial solutions, they further help clients access tailored solutions. Clients can draw on their full suite of rehabilitation requirements in design, development and delivery. A key feature is their ability to optimise inputs and outcomes, from rehabilitation designs and operational schedules, to identifying efficiency gains and equipment utilisation options.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

## Undercon

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Undercon is a specialised service company providing innovative concreting solutions for the mining and civil sectors. Undercon are the pioneer developers of the patented WET BAG Concrete Batching & Onsite Mixing System. They are committed to green initiatives and sustainable practices and understand the responsibility of industry to move towards carbon footprint reduction. Undercon take pride in their work and aim to establish long-lasting partnerships to provide a healthier, greener future.

### Value proposition

The WET BAG System (WBS) eases the pain of concrete supply to underground and remote projects. It creates significant cost savings, assures quality, reduces logistics, and simplifies the need for skilled labour. The WBS provides the ability to design specific requirements of each bagged mix; the only site additive is water. Allowing concrete on demand, anywhere and anytime, the WET BAG may be stored on site ready for use for up to 4 months. This is a revolutionary green initiative and sustainable practice that is not undertaken for this type of product anywhere else in the market. In addition, site costs are lower than a conventional batching plant and the WBS is easily transportable to the next project. The more remote or inaccessible the project, the better the value.

### Primary Sustainable Mining sub-sector

The Small Footprint Mine

### Secondary Sustainable Mining sub-sector

The Zero Carbon Mine

## Voconiq

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Voconiq is a global data science and engagement company passionate about community. Voconiq's proven science-based approach records community views and opinions across the world, providing companies, industries and institutions with valuable insights to inform business practices and shape development trajectories. The company uses world-leading data science techniques, a unique 'research-as-engagement' model of practice, and flexibility to solve the challenges of diverse operating environments. Voconiq believe voices matter and works to increase understanding between organisations and the communities they work alongside, to build trust and strengthen relationships.

### Value proposition

Voconiq delivers miners stronger and more productive relationships with host communities through providing community monitoring data. Voconiq technology and processes enable the effective management of social risk. With Voconiq, miners can obtain and maintain the social performance required with less resources by operating and engaging smarter.

### Primary Sustainable Mining sub-sector

The Community Mine

## Worldpoly

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Australian owned and based, Worldpoly leads the world in the development and production of international standard PE pipe welding fusion equipment. Worldpoly have exported Australian-engineered butt welding equipment to 120 countries and manufacture an industry leading Australian-made high pressure, track driven butt welding range according to ISO & North American standards.

### Value proposition

Worldpoly helps miners to move water/slurry to other locations as required. Their butt welding machines offer low environmental impact through less reliance on heavy truck haulage for de-watering or moving water. High Density Polyethylene (HDPE) pipe when welded properly by qualified technicians will last over 100 years when correctly installed underground. HDPE lasts four times longer than steel for slurry work, and can be repositioned relatively easily. Butt welded HDPE is more cost-effective than using electrofusion fittings and is 100% recyclable. At the end of the project it can be repurposed either on site or off. A fully welded HDPE will not blow apart like a rubber ring jointed pipe system.

### Primary Sustainable Mining sub-sector

The Smart Water Mine

### Secondary Sustainable Mining sub-sector

The Waste Free Mine

## Xenco Services

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Xenco delivers operational improvement support to mining businesses. With decades of top-tier experience, their expert team members couple a pragmatic approach with proven methods and practices to improve business efficiencies and commercial outcomes.

Sustainability services include environmental consulting, closure planning, governance systems and tailings and water management.

### Value proposition

Environmental management is crucial to maintain operational efficiency and compliance. Xenco's team understands the importance of future-proofing your environmental strategy. Xenco unlocks profitability and sustainability benefits through collaboratively solving mine operational challenges.

### Primary Sustainable Mining sub-sector

The Waste Free Mine

### Secondary Sustainable Mining sub-sector

The Small Footprint Mine





# Empowering Green Ambition

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[www.austmine.com.au](http://www.austmine.com.au)