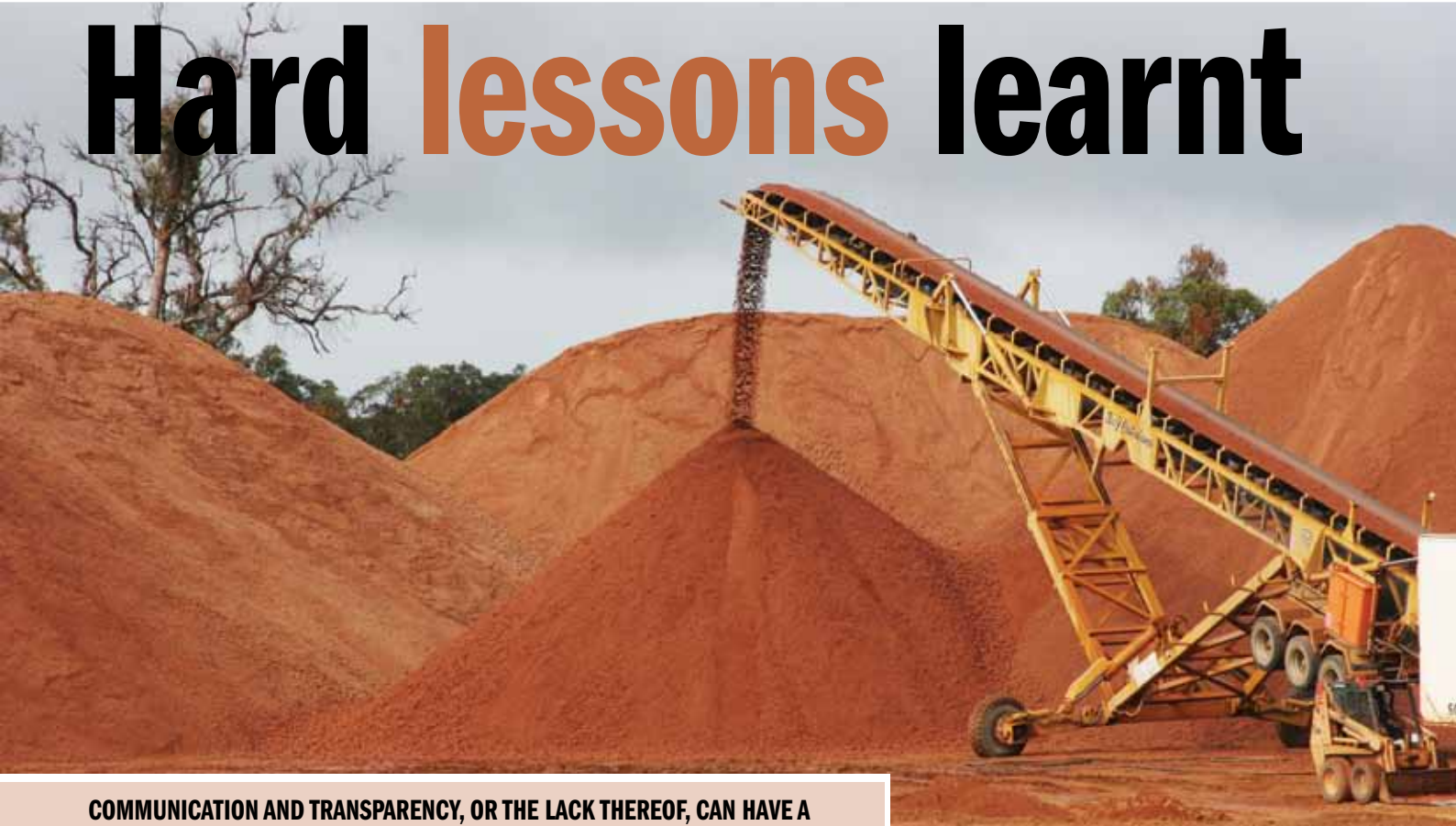


LTO

Licence to Operate

Environmental and social best practice in mining

Hard lessons learnt



COMMUNICATION AND TRANSPARENCY, OR THE LACK THEREOF, CAN HAVE A SIGNIFICANT IMPACT ON THE FORTUNES OF A MINING PROJECT. BY TANIA WINTER

Recent controversy surrounding Remerging WA producer Bauxite Resources' handling of its plans to start mining on the Darling Scarp and accusations by a group of Bindoon farmers and South West landholders that the company failed to follow due process has once again shone the spotlight on transparency within the industry.

It is hard to believe that in this day and age, particularly in a country that prides itself on its mining culture and sound mining policies, such an event can occur. However, in recent times there have been several similar situations where an alleged lack of community consultation had major ramifications for industry.

The most recent case involved a NSW Supreme Court decision in favour of two farming families in their battle with BHP Billiton. They wanted BHP rigs off their Liverpool Plains land.

Farmers have long campaigned against BHP's Caroon coal project, even though the NSW government amended the licence last year to prevent longwall mining under alluvial aquifers or floodplains.

While some might champion the underdog farmers who defeated BHP on a technicality in March, the court ruling opened a can of worms. It broadened the definition of a landholder, forcing explorers to look into access agreements with additional stakeholders, such as mortgage providers and power companies.

This extra red tape was not intended in the NSW Mining Act and the NSW Parliament only passed necessary amendments to clear up the land access issues a few weeks ago. Sound familiar?

WA has not been without incident. One recent example was the lead poisoning incident at the Esperance Port in late 2006 and early 2007 that resulted in the death of 9500 native birds.

The contamination was traced back to Canadian company Ivernia. It was found responsible for the incident after lead carbonate concentrate from its Magellan mine escaped.

What followed was a public relations nightmare for the company, particularly when a quarter of the town's children under the age of five were shown to have

higher than recommended lead levels in their blood.

All shipments were stopped and Ivernia went into damage control.

A subsequent government inquiry found that not only Ivernia but the Esperance Port Authority and the Department of Environment had let the community down.

The inquiry also recommended extra resources be provided by the DEC and that management, infrastructure and monitoring at the port be upgraded.

It also advised that legislation be put in place that a port authority be required to ensure public health was not adversely impacted.

Ivernia started shipping its lead through the Fremantle Port last year under stringent terms. Magellan was allowed to ship material through Fremantle in sealed bags, locked within steel containers. The mine had been on hold for nearly three years.

As part of the terms, Magellan also lodged a \$5 million bond with the WA government.

The sealed shipment process involves sealing lead carbonate concentrate in

two-tonne bags, which are vacuumed before being placed inside bolt-locked steel containers. The loaded containers are washed and carried by truck from the minesite near Wiluna to the railhead at Leonora and then transported by rail to the Port of Fremantle.

At the time, Magellan said the sealed shipments "set a new global safety standard for the handling and transport of lead carbonate concentrate".

The new war front

Fast forward to 2010 and Bauxite Resources has found itself in a similar situation, only this time not over poisoning. It has been accused of trying to push through its plans to develop a bauxite business and alumina refinery in the state without the full support of landowners.

Bauxite Resources managing director Dan Tenardi has also recently resigned.

Residents for Responsible Mining, a group of 70 second and third-generation agricultural families from the Bindoon area, say the company has not considered the cumulative long-term impact of bauxite mining on the Darling Scarp region. They also argue that it has not followed due process. The group was formed in October last year after the company started a four-month, 130,000t trial mining and 16-kilometre haul road campaign in the area.

Other issues raised by the group included roads and road safety, residential and visual amenities, water and the impact on local flora and fauna.

Bauxite has publicly stated its plans to grow from 1.2 million tonnes per annum to ultimately 6Mtpa. In fact, three trial shipments have already left Kwinana and arrived in China.

More recently, landholders in the South West have waged a war against the company's development aspirations in that region. The Bauxite Action Group, convened by Neil Bartholomaeus, accused the Manjimup and Pemberton shires of getting into bed with the company against the interests of agriculture and tourism, which is reliant on the Karri forest, food and wine.

The group claim Bauxite Resources had agreed to join an alliance with the shires for a \$15,000 annual fee.

Bartholomaeus said minutes of a February meeting of the Warren Blackwood Strategic Alliance, which comprises the shires of Manjimup, Bridgetown-Greenbushes, Nannup and Boyup Brook, state that the company agreed to become a premium member of the alliance.

He said there were no other corporate members of the alliance, and one of its functions was to manage grant-funding processes for Royalties for Regions.

Bauxite Resources admitted it had had informal discussions with the alliance about its future aspirations and involve-

ment in the South West, including the opportunity for it to become a member, but stressed it was not a member.

In response to questions put to Bauxite by *Licence to Operate*, it said the company saw a strong link between the goals of the alliance and Bauxite Resources' future aspirations in the South West as a key business stakeholder.

"Bauxite is committed to ensuring its future potential mining and development visions in the region are progressed through extensive consultation with all stakeholders," a company spokesman said.

Bartholomaeus said it was outrageous that the shires had sold out the interests of their communities when they should be protecting land designated "priority agriculture" in planning schemes and ensuring major tourist roads were not choked by 500 bauxite hauling trucks a day.

He said an application under the Freedom of Information Act to the Shire of Manjimup turned up notes of a telephone conversation on February 1 between the chief executive and president of the shire, referring to Bauxite Resources and 5.5Mt of bauxite a year.

"In recent times there have been several situations where an alleged lack of community consultation had major ramifications for industry."

"I have written to the minister for regional development [Brendon Grylls] opposing this improper alliance between shires and a large mining company when the shires are also managing the Royalties for Regions process, and have asked the minister to strip the alliance of that function if Bauxite Resources remains a member," Bartholomaeus said.

"Most people are disgusted at the prospect of strip mining for bauxite in the magnificent Karri forests where Bauxite has applied for tenements.

"Five hundred truck movements a day to haul millions of tonnes of bauxite along the already dangerous South West Highway will shut down tourism.

"We are providing template letters at our NoMining.com website to request the minister for environment [Donna Faragher] to oppose mining of Karri forest, and to request the minister for agriculture and food to oppose any mining of priority agriculture land."

However, this has been refuted by Bauxite Resources, which says it has two tenements granted in the South Darling Range project area, and of the 13 agreements for exploration signed with landowners in the area, these related to private land and not crown land.

In total, Bauxite has 110 agreements with landowners in WA.

Outgoing MD Dan Tenardi said where the company's tenements intersected with conservation reserves, it would not conduct exploration or mining.

"Bauxite Resources in the future may conduct exploration in those forest areas only zoned for logging by the state government, but this is yet to be defined," he said.

"Most of our bauxite minerals are potentially located on established farmlands, and we need the permission of the farm owner to explore and to mine, but on average we expect that about 20 hectares of suitable land generally yields a million tonnes of bauxite, where the landowner receives a per tonne royalty."

Bauxite Resources added that its future potential mining and development visions were yet to be fully defined.

"The company is continuing discussions with relevant regulatory authorities and other key stakeholders including the community on its future potential mining and development visions," a company spokesman said.

"Bauxite Resources has acquired tenements in the North, East and South Darling Range, which incorporates parts of the South West.

"Many of these tenements have been present for a long time, and a critical part of our process is to seek permission from landowners for access to their land for potential exploration."

The company added that its exploration was low impact.

Offtake hold up

Bauxite Resources also was reportedly close to finalising an offtake deal with its Chinese partner, Shangdong Provincial Bureau of Geology and Mineral Resources. To date, no official agreement has been signed. The Chinese group took out a \$9.85 million direct equity investment in the company last year. Bauxite Resources is conducting a bankable feasibility study into developing an 800,000tpa alumina refinery in WA's South West by 2014. It signed a memorandum of understanding last year with another Chinese group, Yankuang Coal and Alumina Smelting Group, which will fund 75% of the cost of the refinery. A subsequent application for the proposed 1.2Mtpa bauxite mining operation was recently ruled by the EPA as requiring a public environmental review.

Bauxite Resources then formally lodged an appeal with the WA Office of the Appeals Convenor contesting that decision.

In a statement the company said the level of assessment was irregular and disproportionate compared with the level set for other similar-scale projects.

"The EPA decision appears to take into account Bauxite's future vision, rather than the specific, minimal impact, six-month mining project," the statement said. **LTO**

Flygt pressurised sewage systems

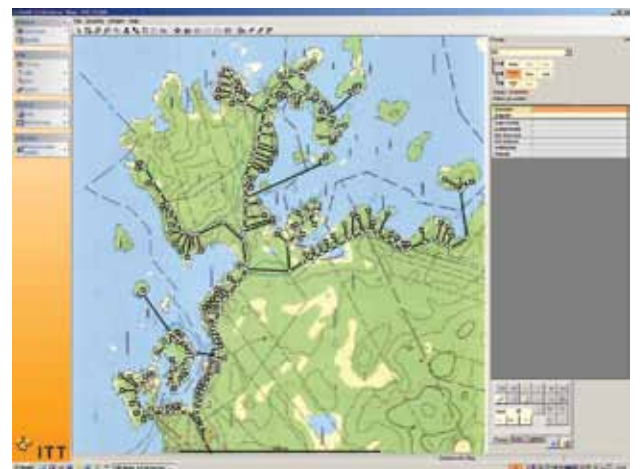
For homeowners, residential associations and professionals



Moving wastewater can be an uphill battle. Obstacles, such as bedrock and tough topographical conditions, present challenges. For times like these, conventional gravity sewer systems don't make the grade. Pressurised sewage systems do.

A pressurised sewage system consists of a collecting tank, a pump and the pipes required to feed wastewater into the sewer main. Several tanks and pumps, or pump stations, and pipes form a pressure sewage network.

With stricter environmental regulations calling for smarter wastewater transportation, pressurised sewage systems have proven to be a safe, flexible and reliable way to move wastewater cost-effectively.



ITT Water & Wastewater uses software specially designed for PSS systems with Flygt pumps.

	Simplex package	Duplex package
Who	Single homeowners, vacation homeowners, private homeowners associations.	Real estate developers, contractors and municipal wastewater professionals.
What	<ul style="list-style-type: none"> • Complete package with single-phase electrical connection • Single pump 	<ul style="list-style-type: none"> • Single or three phase pumps • Communications with advanced SMS and remote supervision
When	<ul style="list-style-type: none"> • For single-family homes 	<ul style="list-style-type: none"> • For a single-family residence, several households or an entire residential community • High reliability in harsh conditions • Higher availability required
Why	<ul style="list-style-type: none"> • Economic • Alarm 	<ul style="list-style-type: none"> • Economic for highest possible availability • Remote control for increased safety and reliability
Where	<ul style="list-style-type: none"> • In hilly or flat areas • For places, such as golf courses and camping grounds, situated outside populated areas • Where bedrock or groundwater present a challenge • Wherever minimum disruption is required or desirable 	

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Cadia's licence to grow

A SOUND WATER MANAGEMENT POLICY HAS GUARANTEED THE EXPANSION OF WHAT WILL BE AUSTRALIA'S LARGEST UNDERGROUND MINE. BY RICHARD COLLINS.

"Bleeding them dry" and "Cadia wants our water" were just two of the headlines in the local papers in 2007 when the Orange City Council agreed to an emergency top up to the local gold mine's 10 megalitres a day allocation of town wastewater.

Three years on, Cadia Valley Operations has won state approval for the \$2 billion Cadia East expansion. This will create Australia's largest underground mine and the world's fourth-largest gold mine. The expansion, signed off by the board in April, will lift its water demand by 6ML, or 12%, to 56ML a day.

The government green light in January was not without opposition; hardly surprising given tensions in the wider region over mine development and Orange's level five restrictions on water use.

However, on the whole it has gone through with remarkably little backlash, suggesting Cadia as something of a case study in managing community and regulator relations. It has secured not just its water supply and licence to operate, but also its licence to grow.

Being the region's biggest economic asset is two edged, giving Cadia weight in local discussions but also making it a target. In 2005 it brought in community relations consultant Futureye after recognising its community interactions were piecemeal and often reactive.

Futureye noted "the links were poorly articulated and uncoordinated" and set out to develop a five-year community relations strategy. The aim of that was not only for Cadia to better understand its stakeholders but also to have those stakeholders better understand the mine.

Last year, for example, 3,000 people attended the 14th open day at the mine in five years, designed to provide locals with insight into the operation.

In 2007, Cadia won the NSW Minerals Council's award for community relations strategy, but the bigger score that year was when it went bucket in hand to the council asking it to cover a three-month water shortfall, some 450ML. Not only was it approved, but an opinion poll showed more than two-thirds of the community supported the decision, including local farmers who previously opposed the mine.

New targets for water

The best engagement strategy in the world won't work if the underlying perfor-



The Fixed Activated Sludge Treatment (FAST) plant

FAST-tracked solutions

One small part of Cadia's water operations is managing effluent from the shower and toilet blocks. It recently installed a Smith and Loveless FAST (Fixed Activated Sludge Treatment) packaged plant from CST Wastewater Solutions.

Built into a 20-foot shipping container, the plant is designed to handle 40 kilolitres to 120kL a day of sewage and other effluent from the mine, ensuring it meets the specifications for reuse in dust suppression.

mance is not improving. Cadia environmental engineer Michael Butcher told the Minerals Council of Australia's 2009 sustainable development conference the company employed a continuous improvement methodology to manage water.

The first generation plan dealt only with regulatory requirements and showed limited site understanding of the system and no performance monitoring. Water use at the time was calculated by assessing the water storage levels and running a number of climatic sequences, a process that took a day to complete.

Cadia also looked for alternative supplies, but quickly ran into community roadblocks, so the second generation plan focused on efficiency, operational issues and regulatory requirements.

In particular, it set a water reliability target of 99%, up from 90% in mid-2008, and implemented a system for evaluating projects based on four criteria – water supply impact, cost, effort and risk. That helped rule out piping effluent from Bathurst, for example, but brought to the top initiatives such as new groundwater bores and optimising the tailings dam return system.

And finally it established key performance measures, including supply security over different timeframes, site water use per tonne milled and effluent utilisation.

A water balance for the site reveals 97% of water is used in ore processing, with minor volumes going to the Ridgeway underground mine and dust suppression in the open cut Cadia Hill mine.

More than a third of the process water goes to feed the ore slurry into the flotation tanks and is then recycled from the waste and concentrate streams, the latter case meaning from the tailings thickeners and storage.

Planning for expansion

Cadia's water management improvements were integral to winning approval for the Cadia East expansion. Two hydrology experts assessing the project for the Department of Planning found it could access enough water under existing licences to meet the existing project's needs, including from more efficient water use and increased capacity in the mine's existing dams.

The efficiency gains include further improvements in the use of recycled water and harvesting of licensed water, plus a new \$50 million dewatering facility replacing the existing dewatering plant.

"Importantly, if at any stage the mine is not able to show it has sufficient water for the expansion, it must curtail its operations," Planning Minister Tony Kelly said in signing off the project.

Water is the top concern in the consent conditions for the new mine. Cadia is required to develop a comprehensive water management plan that includes measures to ensure advance warning of any water impacts. More stringent, it must provide compensatory water supplies to any landowner whose ground or surface water supplies are affected.

Cadia is also having to renegotiate its 1998 contract with the council to access up to 10ML a day of treated effluent for the life of the mine. A history of strong engagement and cooperation will no doubt help smooth that process. **LTO**

Taking a healthy look

HEALTH IMPACT ASSESSMENTS ARE APPEARING ON THE MINERALS SECTOR'S RADAR THANKS TO THE BENEFITS THEY BRING. BY MAX PICHON



Take a deep breath: off-site health impacts are now on the radar.

Nearly 40% of children aged 9-15 in the Hunter Valley and New England regions have at some stage suffered from asthma, according to new data from the NSW government. This is 12 percentage points above the state average.

The report did not blame mining, but such is the conflict with the local industry at the moment that it did not take the community long to point the finger.

It points to the need for health impact assessments. This is a practice increasingly on the minerals sector's radar with its specific focus on worker and community health rather than the pollution focus of environmental assessments, the community focus of social studies or the industry's traditional safety focus.

"The Australian mining industry had recognised that health management was becoming the poor cousin to safety management," Minerals Council of Australia assistant director of safety and health Megan Davison said.

"With a renewed focus in the last 10 years on site-specific analysis, we have increased our assessments of the health impacts of our operations on the workforce. Now we also want to identify and manage any off-site impacts to the health of the communities within which we operate."

In February, the International Council on Mining and Metals released a nine-step guide providing insights for project professionals and stakeholders that include local health, social care and welfare services. So what are the key steps according to the Good Practice Guidance on Health Impact Assessments?

1. Screening – The first step is deciding whether a HIA is necessary. Screening can help decide to what level or depth a HIA should be undertaken and involves an initial assessment of the potential health impacts of a project, and the number and range of people likely to be affected.

One of the innovations in the guide is its recommendation for a "first look" rapid HIA undertaken by in-house health and safety executive teams during a project's early feasibility and planning stages.

2. Scoping – Assuming a HIA is deemed necessary, scoping sets the boundaries and

terms of reference, including how detailed it should be. Issues include the geographical extent, local communities to be considered, potential impacts to be assessed, key stakeholders to be consulted, methods to be used, make-up of the HIA team, timeline and what will happen to any recommendations.

3. Community profiling – This develops a baseline assessment and community profile, with a particular focus on existing health and wellbeing problems and assets.

Part of that is a desk-based profile using national and local demographic, social, economic, environmental and health information where available. There also is on-the-ground work such as local surveys, focus groups and discussions with community health and development workers.

"The Australian mining industry had recognised that health management was becoming the poor cousin to safety management."

– Megan Davison

4. Stakeholder involvement – Next is development of a two-way dialogue and information exchange between the HIA specialist, project team, key stakeholders and local communities.

Stakeholder and community talks should start with a stakeholder mapping analysis. This will identify the different groups' values, the challenges facing them, their power relationships and social status and, most importantly, what they want to get out of the process and any conflicting interests.

5. Gathering evidence – At the halfway mark comes the review of scientific and other evidence about the potential health impacts and effective mitigation and enhancement techniques. This must be undertaken in a systematic way, with limitations of a project explicitly stated.

6. Analysis of health impacts – Health impacts can range from a single household to a whole community, and also at organisational and institutional levels. They need to be considered at all these levels and at each different phase of the project – design,

construction, operation and closure.

At this point it is important to analyse the potential health inequality/equity and cumulative impacts by considering which groups will benefit from the mining project, which will be negatively affected and which will not be affected.

7. Mitigation measures – Identifying the potential pros and cons of mitigation measures is an important part of the process. It should be based on the significance of the potential health impacts and the acceptability and wishes of local communities.

These changes include "hardware" aspects such as location, technology or construction techniques, and "software" aspects such as contractual requirements, partnerships and management procedures.

The guide warns the generic hierarchy of impact mitigation measures – ranging from avoid to compensate when all else fails – is less relevant for health impacts. However, it does develop a Hierarchy of Health Enhancement, from just providing education and information to a best case of building in benefits for all.

8. Reporting – A final HIA written report should be presented, with a public document provided to decision makers and local communities. The key findings should be presented orally to these audiences as well as online.

The draft report should be subject to consultation with key stakeholders and informants, and their feedback discussed and, where valid, incorporated into the final report in a transparent way.

9. Developing a health plan – The final step outlines the formal process for discussing the recommendations of the HIA and deciding how to implement each aspect of the resulting Health Management Plan.

Follow-up activities should be part of such a plan and include monitoring of the actual health and wellbeing impacts and evaluation of both actual and predicted impacts.

Download the report at www.icmm.com/library/hia **LTO**

Rubbish to resource

THE GREEN RUBBER PROJECT AIMS TO HELP MINERS SLASH THE ENVIRONMENTAL AND ECONOMIC COSTS OF TYRE DISPOSAL.

FOR many years, used tyres from mining operations have been disposed of by burial. Out-of-service or off-the-road (OTR) tyres represent around 65,000 tonnes of waste each year.

This wastage comes at a high price, with the size and shape of the tyres making them hard to handle and costly to move.

OTR tyres also have had significant attention from environmental authorities. They are calling on the industry to find ways to utilise the tyres, rather than burying them.

The Environment Protection and Heritage Council meeting of Environmental Ministers in Western Australia in November targeted all tyres for regulation under national environment protection measures.

The NEPM would aim to recycle the waste and ban the burial of tyres across Australia, including at minesites.

The Australia-wide Green Rubber project is working to identify or develop solutions for the recovery, downsizing, transport and recycling of mining industry OTR tyres.

In one such solution, Green Rubber identified equipment available from manufacturers in the US that can reduce an OTR tyre from more than 5 tonnes to pieces weighing less than 15kg, allowing them to

be fed into a recycling plant.

Green Rubber has made considerable progress in identifying and analysing products that could be produced using recycled tyre rubber.

Applications include feedstock for road surfacing, blasting material for mining and a multitude of moulded construction products.

“The project relies on the ability to secure large quantities of OTR tyres continuously over a number of years, to ensure economies of scale and growth impact on the local community over time.”

Green Rubber directors Africa Zanella and Phillip Isaacs said the rubber could also be mixed with recycled plastics to produce railway sleepers, mine posts and flooring underlays, replacing timber.

Recycling OTR tyres could save mining companies money from tyre disposal, however, Zanella and Isaacs said using the products produced from the rubber could offer further savings.



“The Green Rubber project will bring financial benefits to the mining companies, not just in substitution of the raw material, but also in the safety and longer life-cycle performance of the Green Rubber products,” they said.

The capital investment required to implement the project is about \$65 million, with additional investment in downstream product manufacture.

The project relies on the ability to secure large quantities of OTR tyres continuously over a number of years, to ensure economies of scale and growth impact on the local community over time.

Recycling used tyres could offer financial as well as environmental benefits for miners.

LTO

Study factors in sustainability

A PLAN aiming to deliver better sustainability as well as business outcomes for a Papua New Guinea copper-gold mine is currently being developed.

Sinclair Knight Merz was hired by Frieda River developer Xstrata Copper to put together the Sustainability Integration Plan. The SIP has been developed as part of the pre-feasibility study for the mine.

SKM Frieda River project manager Paul Greaney said the SIP was part of the infrastructure component the consultancy was preparing for the PFS.

“Key elements of the sustainability integration have included the translation of corporate level sustainability requirements to project level objectives, application of sustainability considera-

tions to major design decisions and a transparent monitoring and reporting framework,” Greaney said.

“The sustainability integration in the PFS has laid the foundation for further integration in the feasibility study, which will draw on the findings of the environmental and social impact assessment and a suite of strategic plans for the mine.

“By providing specific objectives and decision-making tools, and linking with the environmental and social knowledge base, the design team will be able to deliver a study that meets Xstrata Copper’s policy commitments and meets international standards.”

The Frieda River project is planned to include power, port and airport facilities, roads, and mining infrastructure.

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