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Company Announcements Office
Australian Stock Exchange
Level 3, 530 Collins Street
MELBOURNE VIC. 3000

Dear Sirs,

For Immediate Release
Haoma to Test New Intellectual Property

Haoma Mining has today reached agreement with Biotech Solutions Pty Ltd and Elazac Mining Pty Ltd to use its processing plant at Bamboo Creek (Pilbara, WA) to test intellectual property (IP) jointly developed by Biotech[1] and Elazac[2] for the leaching of Pilbara ores to extract gold, silver and other metals.

Biotech Solutions and Elazac Mining have each been actively involved in the development of new mineral processing techniques and have advised Haoma that they have negotiated an in principal 50-50 Joint Venture to combine their intellectual property in this field.

Haoma's agreement to test the new technology is an extension of its existing agreement with Elazac Mining under which Haoma has rights to free use of the Elazac Process which has previously been developed and tested at Haoma's Pilbara mining operations.

Haoma will continue to have free use of any IP developed from the Biotech/Elazac JV.

Biotech and Elazac intend to commercialise the joint IP both within Australia and outside Australia, but have not yet finalised their commercialisation plan.

The testing programme is expected to take 4-6 weeks to complete. Under the terms of the agreement, on completion of the tests Haoma will report significant results.

Elazac Mining Pty Ltd is a company associated with each of the Directors of Haoma Mining.

Yours sincerely,

Gary C. Morgan
CHAIRMAN

[1] See attached article published in May 2006 Mining Magazine, pages 31-34.
Also Mining Journal Online
[2] Refer to Haoma January 17, 2005 ASX Announcement in relation to patent of the Elazac Process
http://www.haoma.com.au/2005/198801.pdf

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Search for philosophers' stone

Cyanidation, patented in 1887, has been accepted as the most effective process in the recovery of gold

BY DES CLIFFORD

FIRST used at the Crown mine in New Zealand, cyanidation has been vital in the development of the South African gold-mining industry in particular (owing to the relatively low-grade nature of the local orebodies, where the gold is very finely disseminated in silica host rocks).

Without doubt, the era of major technical development in gold recovery came about between 1970 and 1990 with the introduction of heap leaching, activated carbon processes (CIP/CIL), and improvements in the treatment of refractory ores using fluid bed roasting, whole ore roasting, pressure leaching and biological oxidation.

Cost-cutting and environmental sensitivities related to cyanide are two major issues facing the gold industry today. Any process that will decrease pressure on either front is welcomed.

SGS Lakefield Research and Thorpe Consulting have developed a new process, known as the Hannah Process, which uses strong base resin technology to extract free cyanide radicals as well as metal-cyanide complexes from gold tailings. Especially well suited for the extraction of copper cyanide, the Hannah Process can be applied to either solutions or pulps.

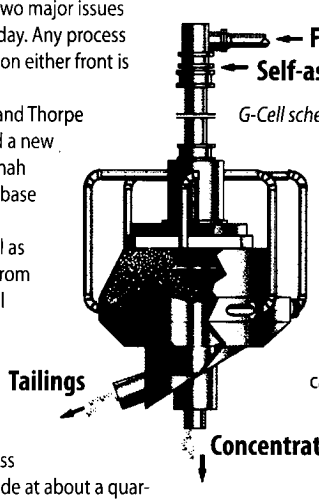
The novel Hannah Process can produce recycled cyanide at about a quarter of the price of new cyanide. Indeed, when the cost of cyanide destruction is included (which is now mandatory in many jurisdictions), the cost may be less than one-sixth that of buying and destroying new cyanide.

Some features of this process include its ability to:

- Efficiently extract free cyanide and metal cyanide complexes in 2-3 adsorption stages.
- Rapidly elute cyanide and base metals under ambient conditions.
- Separate and recover valuable by-products in the eluate, such as copper compounds.
- Recover cyanide for direct recycle-to-leach, without volatilising toxic hydrogen cyanide gas.

UK-based Maelgwyn Mineral Services (MMS) is involved in a number of developments in the processing of precious metals, and especially in the treatment of refractory gold ores. MMS's work has included advancements in pneumatic flotation technology, which was first implemented in the mid-1980s, resulting in the development of the Imhoflot flotation process and, specifically, the G-Cell.

The G-Cell is based on the concept of using centrifugal forces to speed up the separation and removal of the froth phase during flotation by introducing the aerated feed tangentially into the separating vessel to produce specific rotational speeds in the cell. The cell is not designed as a gravity separator, however, and the rotational speeds achieved are not high enough to strip coarse particles from the froth. The centrifugal froth separation has now reduced the residence time in the cell to about 30 seconds, resulting in a multi-fold increase in flotation unit capacity. Also, the aeration unit used in the Imhoflot G-Cell is self-aspirating and obviates the need for costly blowers.

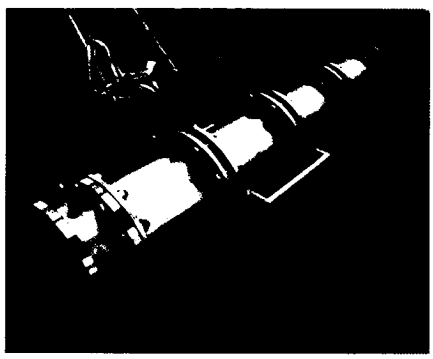


G-Cell schematic

A spin-off of MMS work into aerators for pneumatic flotation is the development of the Aachen reactor, which can be applied to the oxygenation of pulps for the cyanide leaching of gold ores.

Operating at a pressure of 350-450 kPa, the Aachen reactor increases the equilibrium oxygen solubility, which varies directly with pressure. Compared to normal sparging of leach tanks with lances, the reactor subjects the oxygen and the slurry to a highly turbulent shear zone, which maximises the oxygen transfer.

Many ore types contain oxygen and cyanide-consuming gangue minerals such as pyrrhotite and other sulphides. This requires the addition of extra oxygen over and above that of atmospheric oxygen to ensure acceptable extraction rates and residence times. The benefits of enhancing the dissolved oxygen concentrations in cyanide leaching include reduced leach times, improved recovery and reduced cyanide consumption. This last benefit is particularly relevant where oxidation of pyrrhotite before cyanide addition prevents the subsequent formation of thiocyanate.



An REA300 Aachen reactor was recently supplied to Newcrest's Telfer Stage 7 expansion project for the CIL circuit. The unit can treat up to 350 m³/h of slurry

Having worked closely with South Africa's Deswik Ltd to develop fine grinding technology for use in refractory gold processing, MMS recently became the exclusive agents for the Deswik ultra-fine grinding mill in Europe and Australasia and non-exclusive for the rest of the world.

Since the technology was introduced some 15 years ago, Deswik has embarked on an extensive redesign programme to address issues with the machine's seals and filters owing to horizontal bead milling technology. Changing to a vertically-stirred design that incorporates a patented impeller design for higher tip speeds, the first 50L Deswik mill was supplied to African Pioneer Mining's Agnes gold mine in South Africa, while the nearby Barbrook mine, owned by Caledonia Mining, has taken delivery of a 250L unit for regrinding of flotation concentrates as part of a plant upgrade to 15,000 t/mth that now also incorporates an Imhoflot G-cell cleaner circuit ahead of the concentrate leach circuit.

While cyanidation is the preferred method of gold recovery – and is likely to remain so for the foreseeable future – increasing pressure from governments and associated bodies about potential environmental hazards associated with the process have prompted several companies to investigate viable alternatives.

Developed by US-based Haber Inc, the Haber Gold Process (HGP) is a unique environmentally-friendly gold-extraction technology that makes use of a proprietary non-toxic lixiviant, which has been shown to be effective on a number of typical gold ores, such as those containing microfine gold, oxidised ores with significant heavy metal content, acidic ores, some carbonaceous ores, heap leach-type ores and concentrates. HGP has also been effective on limestone and hematitic ores and can be used to extract gold from tailings.

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Capital equipment requirements are quite modest and the process is effective with high- and low-grade ores. In Vat leaching, HGP performs with exceptionally fast extraction rates, making its use especially suited to counter current decantation circuits in a two- to six-hour extraction cycle. HGP responds to conventional procedures for recovering gold from solution using activated carbon, electrowinning, modified Merrill-Crowe and other precipitation methods.

Laboratory tests have shown that the standard HGP is at least equal, and in some cases superior, to the standard cyanide process in extracting gold from a variety of ores. In such one study, six different ores (from Australia, China, Nevada, California and Colorado) were tested. In each case, HGP extracted as much or more gold in less than five hours as the standard cyanide process extracted in 24 hours, with yields of up to 99%.

Haber has recently completed development of its new commercial gold-extraction system, an articulating mobile unit able to process up to 500 kg of ore per cycle. Rugged and simple in design, the unit is low-maintenance, portable and can be rapidly deployed in remote areas with little infrastructure. The vertical decantation capability makes for an extraction routine that can be performed quickly and safely.

Given the flexibility of the concept behind the mobile system, similar units with varying capacities can be designed and built to effectively service both small and moderate-sized mining operations. The general concept can also be tailored to handle small-scale artisanal mining operations, which continue to rely on mercury extraction methods. Haber has already signed a licensing agreement with its existing HGP licensee, Gold City Inc, to use the process in mining operations in Ghana.

Haber's mobile gold recovery unit and proprietary accelerated gold recovery system

Another company evaluating options to conventional cyanidation is Sydney-based Biotech Solutions, which has adapted the science of magneto hydro dynamics (MHD) for mining and other industrial applications.

MHD relates to the reaction of electrically-conducting fluids within a magnetic field. When a fluid passes through a magnetic field at a particular velocity and magnetic-field strength, the water molecules become 'excited' in a manner similar to that which occurs under the influence of ultra-violet light and other forms of electromagnetic energy.

Biotech has demonstrated that this phenomenon can lead to a change in the kinetics of a chemical reaction, significantly an acceleration of the oxidative leaching of gold in the CIP process.

The company has patented an MHD-based system, which has been shown to speed up the gold dissolution process by up to 16 times, while maintaining gold recoveries. Moreover, reduced cyanide consumption has resulted in reagent savings of up to A$60/oz. It is also expected that the scale build-up on the carbon and heaters will be prevented, leading to better operational efficiencies and further cost-savings.

According to Biotech, the system can be installed within three hours with minimal disruption. Furthermore, once installed, the 1 m^3 system can be by-passed for maintenance or deactivation with no disruptions to daily operations.

The company is seeking a partner or partners to help validate and further quantify the laboratory results, with a view to commercialising the procedure when field trials are successfully completed.

Conventional methods used in gold recovery processes suffer from inherent problems (see box, p34).

Utah-based IBC Advanced Technologies has successfully developed two cost-effective products (and SuperLig 135 for low gold concentrations and SuperLig 127 for higher gold concentrations), which

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overcome many issues with current technology.

Based on a molecular recognition technology (MRT) system, IBC's system incorporates a two-stage process for the selective extraction and recovery of gold, copper and a mixture of other base metals from mine leach cyanide solutions. The gold is first recovered as a high-purity salt, followed by the separate recovery of the copper as a sulphate salt. Any other base metals are then collected as a cyano-anion concentrate, which can be recycled back to the leach solution.

SuperLig 135 is effective for removing gold at feed concentrations of less than 1.0 mg/l, making the product particularly attractive for scavenging applications such as gold removal from tailings dam streams. Although this SuperLig product has a very high efficiency rate for recovery of gold at low concentrations from solution (in excess of 90%), it does not completely reject base metals and iron. However, this is not considered detrimental owing to the extremely high gold-recovery efficiency. The resin can be eluted using NaOH or NaCl.

SuperLig 127, meanwhile, is highly selective for gold at concentrations of 0.5-10.0 mg/l, and can be eluted with water at around 70ºC. The product is suitable for use in several process applications, including gold recovery and purification from clarified pregnant Merrill Crowe solutions, or gold recovery and purification from clarified heap-leach solution.

ISSUES WITH CONVENTIONAL GOLD RECOVERY PROCESSES

- Excessive usage of zinc dust in the Merrill Crowe process for gold precipitation.
- Loss of fine, loaded carbon from CIP/CIL circuits.
- Presence of other impurity elements in the gold recovery circuit, which interferes with gold recovery.
- Inability to recover gold from solutions with very low gold concentrations.
- Complex/expensive carbon regeneration procedures.
- Long recovery and recycling pipeline.
- High cost of outside toll refining.

SGS Lakefield Research has undertaken extensive research in recent years to develop new technology to improve platinum-group metals (PGM) metallurgy. This work has resulted in development of several new flotation modifiers/depressants, clay dispersants and PGM collectors. These new reagents can result in a major improvement of PGM concentrate grades and recoveries, and are readily transferable to operating plants.

Many of the conventional reagents used in the PGM industry to depress floatable, non-sulphide gangue minerals, are also sulphide mineral (PGM carriers) depressants. So these depressants can result in a reduced flotation rate for the valuable PGM fraction.

One of SGS Lakefield's latest commercially-available developments is a new group of "highly effective", and more selective, gangue depressants from its so-called 'PD series'. Tests on ore containing floatable gangue have shown that this latest line of depressants can result in improved PGM concentrate grade from 80 g/t total PGM to over 300 g/t PGM, without any loss in recovery.

Another problem encountered in PGM flotation is the presence of clay-like slimes, which occur in varying amounts in a number of South African and Australian plants treating PGM ores. These slimes lower PGM recovery and selectivity, especially towards chromium, even when they are present in small amounts. This poor selectivity is due to the fact that collector requirements are relatively high in the presence of these slimes: a problem that has not hitherto been addressed adequately.

SGS Lakefield has made major progress in developing clay dispersant/depressants resulting in substantial improvement in metal recovery from clay-containing ores, as well as a reduction in collector consumption. Two groups of these reagents (the QR series and DQ series) are available for different types of clay minerals.

SGS has also developed a range of collectors based on xylene chemistry, and which are highly beneficial for treating PGM-containing ores. These collectors are particularly effective in treating partially-oxidised PGM ores and ores containing PGM as alloys.