

# **IM** *International* **mining**

Informed and in-depth editorial on the world mining industry

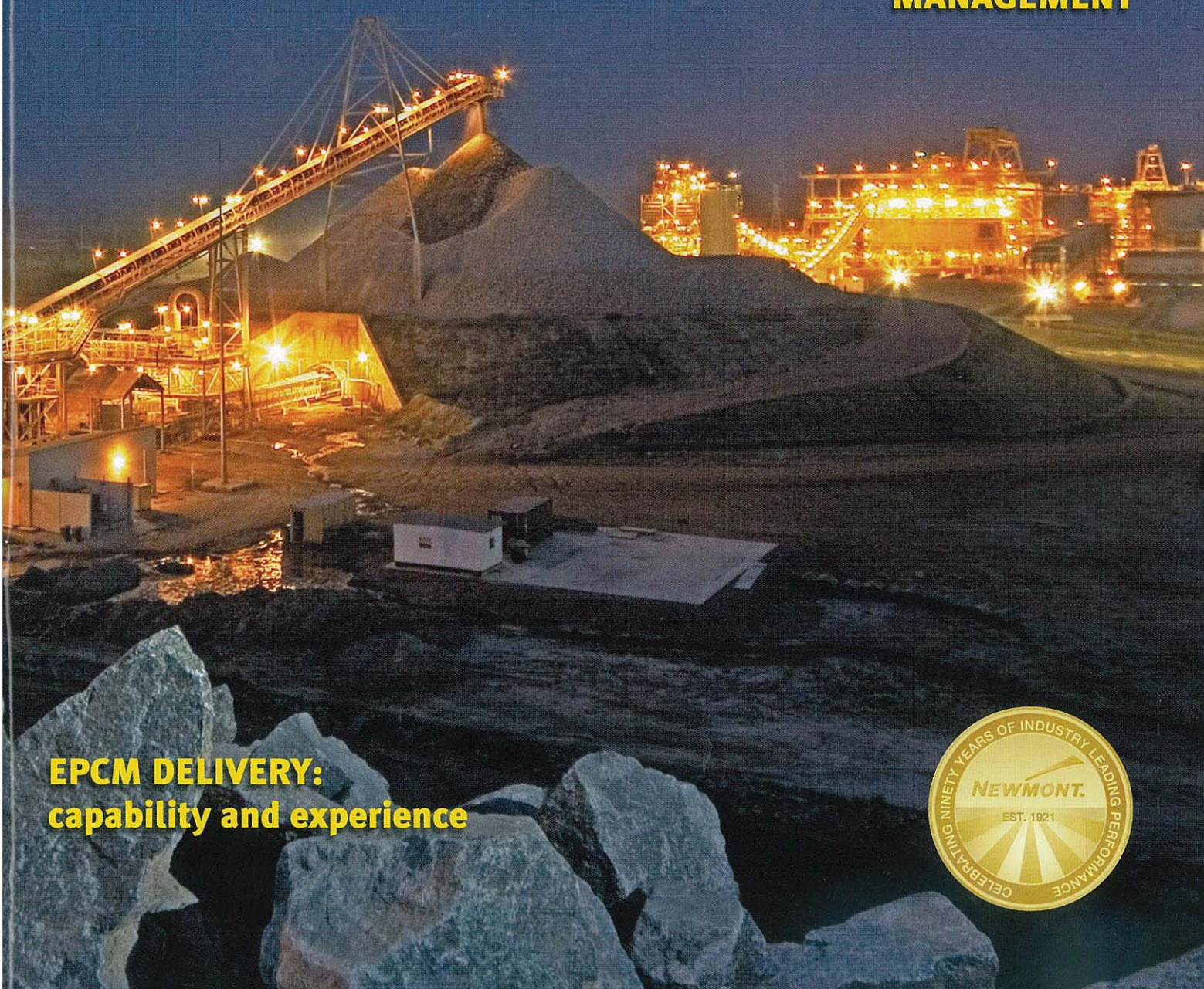
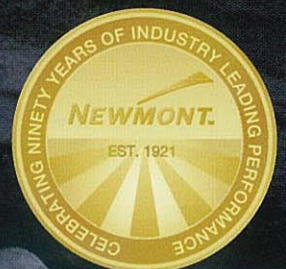
**GOLD PROCESSING:  
new horizons**

**NEWMONT  
IN AFRICA**

**IPCC:  
momentum  
gathering**

**MINE POWER  
MANAGEMENT**

**EPCM DELIVERY:  
capability and experience**



### Albion advances

In early January EnviroGold reported that construction activity on its 100% owned, 75,000 oz/y gold, Albion processing plant in the Dominican Republic is accelerating following finalisation of all major construction and equipment supply contracts. At that time, two of the three critical items of mechanical equipment (ball mill and Isamill) had been fully installed; the third critical mechanical item (modular oxygen plant) was to be shipped from South Korea in April 2011, well before its required date.

Trial mining of the high-grade Las Lagunas tailings deposit was to be undertaken in April-May 2011. Construction is scheduled for completion by the end November 2011, with ramp up to full gold production expected to take place between December 2011 and March 2012.

Las Lagunas is expected to produce 65,000 oz/y of gold and 600,000 oz/y of silver. The JORC Inferred resource of 5.13 Mt of tailings grades 3.8 g/t Au and 38.6 g/t Ag.

EnviroGold says it uses "patented next generation technology to extract gold and silver from metallurgically complex mineral resources in Latin America. It has agreements with Xstrata Technology to use its ground-breaking Albion Process Technology which enables EnviroGold to extract gold and silver from refractory ore or mine tailings and eliminate the threat of acid mine drainage, resulting in a net benefit to the environment.

"EnviroGold is also applying its expertise to securing gold and silver production from the mining of oxide or sulphidic ore using traditional gravity, carbon-in-leach, or heap-leaching processing."

Xstrata Technology's Albion Process is a sulphide oxidation process to oxidise refractory ores such that the recovery of precious and base metals can be achieved using conventional extraction technology, such as cyanide leaching in the case of gold. It is a combination of two technologies, ultra fine grinding and oxidative leaching at atmospheric pressure, which results in the sulphide particles being oxidised, facilitating metal recovery.

Ultra fine grinding is essential to the process, as it increases the surface area of the sulphide particles enhancing the rate of downstream chemical reactions as well as



*Mike Houn, Hydrometallurgy Manager at Xstrata Technology explained Las Lagunas is the first Albion plant to be used for gold processing, with two others operating on zinc, and another under construction for refractory gold processing also. He says the trend towards harder to recover refractory gold deposits means processes like Albion will be favoured due to their low processing cost. He also noted that part of the EnviroGold circuit was the recently released HyperSparg<sup>TM</sup> air sparging technology, which has improved the Albion Process due to the extremely fine bubble that it generates, which benefits the leaching reaction due to the high probability of bubble particle contact*

distorting the mineral crystal lattice, lowering the required activation energy for the chemical reaction to follow. This is achieved through the use of an Isamill, Xstrata Technology's patented horizontally stirred mill that uses a series of rotating disks inside a stationary shell to stir small ceramic beads. The ceramic beads impart energy to the sulphide particles resulting in an ultra fine grind. The ceramic beads are inert and have no impact on the chemistry of the slurry as they break down over time in the mill.

Following the ultra fine grinding stage, the sulphide slurry is passed to a series of covered

agitated tanks, where oxygen is introduced at the base feeding a chemical reaction that results in acid and heat generation as the sulphides oxidise. The acid and heat, along with the oxygen, drive the reaction until the sulphide particle passivates with a layer of gypsum. Due to the ultra fine nature of the sulphide feed, up to 94% of the sulphide particle can be oxidised before the reaction ceases.

Acid generated during the oxidation of the sulphide ores is neutralised during the process, eliminating the potential for acid mine drainage from the final tailings slurry. The Albion Process is able to oxidise ores that are high in toxic elements such as arsenic and antimony, leaving elements in a stable form with the resulting tailings stream.

Operating and design parameters for the Albion Process are established at HRL Testing's Laboratory facilities in Albion, Brisbane. The laboratory has a laboratory scale Isamill and a

number of Albion reactors as well as access to an Albion pilot plant, first developed for Xstrata's feasibility study into the Pueblo Viejo gold mine, which is the source orebody for the Las Lagunas tailings.

EnviroGold also says "the capital requirements for the Albion Process are significantly lower than alternate oxidising technologies such as pressure oxidation, whilst the chemical complexity of the process is less than bacterial oxidation which requires the maintenance of living bacteria which can be sensitive to changes in ore chemistry and temperature."

EnviroGold intends to use the Albion process on two adjoining mine developments in Ecuador, each of which is planned to produce 100,000 oz/y of gold.