

# ANGLO AMERICAN: LOS BRONCES

CHAMPIONS OF CHILE'S COPPER



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*The Los Bronces mine in the Chilean Andes is continuing along a path to becoming the fifth largest copper mine in the world and one with several decades of productivity still ahead of it*

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Approximately 65 kilometres away from Santiago, in the Metropolitan Region, and 3,500 metres above sea level, one will find the Los Bronces division of Anglo American. Managed by a team of executives, the head of which is General Manager, Christian Thiele, the Los Bronces division boasts a workforce of more than 1,700 people, including company employees and operation and project contractors. Collectively they are responsible for implementing the Los Bronces Development Project, the objective of which is to boost the mine's production capacity.

An open-cut copper and molybdenum mine, Los Bronces produced 221,762 tonnes of fine copper in 2011, including high-purity cathodes and copper concentrate, as well as 948 tonnes of molybdenum concentrate. The ore extracted from the mine is crushed and transported down a 56 kilometre long ore slurry pipeline to the Las Tórtolas flotation plant, where copper and molybdenum concentrates are produced.

In November 2007 the board approved an expansion plan aimed at increasing the mine's annual copper output by some 278,000 tonnes in its first three years and by around 200,000 in the first ten years. Construction of the project started up in 2007 and includes the introduction of new grinding facilities in the Confluencia sector, a flotation plant at Las Tórtolas in Colina, and new piping and pumping stations. Molybdenum output is expected to rise to some 5,400 tonnes annually. With a total start up capex of \$2.8 billion, the project produced its first concentrate in November 2011.

Confluencia from above



# Innovation in Blasting to Save Energy at the Mine

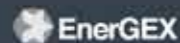
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- Optimization of drill pattern design for highly energy-efficient blasting.



An environmental impact study for the project, carried out in 2006, was also given formal approval by Chile's National Environmental Agency (CONAMA) in 2007. The study itself considered the use of areas intervened to date and will therefore not affect other environmental assets. Most of the additional water will come from greater recirculation from the Las Tórtolas tailings dam to the mine. The quantity of fresh water used per tonne of copper produced will therefore drop by around 40 percent.



Inspecting the copper sheets

Production at Los Bronces is fairly traditional, being as it is an open-pit mine where ore is transported by truck to a bank of two crushers and later by conveyer to grinding facilities, for a total processing capacity of 148,000 tonnes per day. The mine's SAG mill uses modern gearless drive technology, where the axis of the mill is mounted with induction

windings and becomes the motor drive rotor, while the grinders bristle with sensors and circuits to control speed, flow and lubrication.

At its peak of output, Los Bronces will

## ENAEX



### Working as a Team

With a history of 92 years operating in the market and more than 25 years supplying and providing services to Anglo American, Enaex is the leader of integral rock fragmentation services and ammonium nitrate production in Chile. The company is also present in more than 40 countries, supplying explosives and ammonium nitrate. Thanks to the teamwork between Anglo American and Enaex, various successful initiatives have been carried out in the Los Bronces division, such as Hidrex®, a variable density product that is specially designed to be used in controlled blasting, and wall control. The Milodón®, explosives mixer truck will also soon start operating in the same company division. This truck is the largest of its

kind in the world, with capacity for 30 tons in situ. Milodón® represents significant benefits in terms of both productivity and safety. On the other hand, the Air Blast Monitoring service implemented in the El Soldado division also stands out, as it allows Anglo American to measure the impact that air blasts caused during mining operations may have in the community, and then search for mitigation strategies. In terms of innovation and new products, Energex® high-power explosive should be highlighted, with its fragmentation power that lowers the ore "work index" aiming to reduce electricity consumption in crushing and grinding, improving the processing capacity of the crusher.

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Routine cleandown of the exploration access tunnel



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become the fifth largest copper mine in the world. Based on the latest expansions, despite having mined there for the best part of 150 years, Anglo American estimates the mine will be productive for roughly a further 30 years whether or not further deposits are discovered.

Los Bronces is just one of five operations Anglo American operates in four regions of the country with shareholding in a sixth, all managed from a head office in Santiago. In fact, Anglo American is one of the most important copper producers in Chile.

Being such an important part of the Chilean economy, it should come as little surprise that Anglo American recognises and honours its social responsibilities. In addition to their individual corporate initiatives each division of the group is responsible for implementing their

own community engagement plans, which are based on Anglo American's Good Citizenship Principles and the results of its socio-economic assessment toolbox (SEAT) process.

In the case of the Los Bronces division its community engagement plans are focused on four work areas, these being education, health, the environment and social development, with the districts directly benefiting from its work being Colina, Lo Barnechea and Til-Til

and the town of Riecillos in the district of Los Andes. In 2009 alone, more than \$2.3 million was allocated towards these community engagement projects, 85 percent of which was directed specifically towards education and academic infrastructure programmes. In addition to the contributions made to these programmes, the division donated \$32,516 to hold local celebrations and processes and support the work of the fire department.

**“LOS BRONCES PRODUCED 221,762 TONNES OF FINE COPPER IN 2011, INCLUDING HIGH-PURITY CATHODES AND COPPER CONCENTRATE”**

General view of the open pit at Los Bronces



# 1,700+

Size of Anglo American's  
Los Bronces workforce

In the year ahead Anglo American will also be utilising and leveraging the knowledge and experience gained at Los Bronces to develop a significant high quality copper prospect at Los Sulfatos, six kilometres south of its current activities. Based on 22,000 metres of drilling, the current Inferred Mineral Resources are estimated at 1.2 billion tonnes at 1.46 percent copper and 0.02 percent molybdenum, containing an estimated 17.5 million tonnes of copper. The deposit is open in various directions and in terms of overall potential for the Los Sulfatos exploration target, the tonnage is expected to be between four and five billion tonnes at grades of between 0.8 percent and 1.0 percent copper.

Located within and under high mountain ridges at altitudes between 4,000 and 4,500 metres, the Los Sulfatos prospect poses unique environmental challenges, however, considering Anglo American's track record within Chile and similar sensitive geographic regions the smart money is on Los Sulfatos emerging into a development of equal importance to that of Los Bronces. **BE**

For more information about  
Anglo American: Los Bronces visit:  
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