

## Argentina Mining

*The country's impressive geological potential should help resolve the disparity between pro and anti-mining provinces.*

A REPORT BY GBR FOR E&MJ

### TABLE OF CONTENTS

Argentina and the Mining Opportunity .....	54
Interview with Mining Secretary Dr. Jorge Mayoral .....	56
Argentina—On the Map of Multinationals .....	58
A Top Exploration Destination .....	63
The Strategic Minerals Advantage .....	67
Improving the Provider Base .....	71

This report was researched and compiled by Global Business Reports (www.gbreports.com) for *Engineering & Mining Journal*. Editorial researched and written by Alfonso Tejerina (alfonso@gbreports.com) and Marina Borrell Falcó (mfalco@gbreports.com). (Photo courtesy of Barrick)

# Argentina and the Mining Opportunity

*With significant mines developed over the last 15 years and immense geological potential, the Argentinean mining sector has set the foundations to become one of the world's major mining countries. The task ahead is to convince Argentineans that this is good news.*



Alumbrera was the first large mining investment in Argentina in the 1990s. (Photo courtesy of Minera Alumbrera)

It was only in the 1990s that the Argentinean government created the conditions for the development of a modern mining sector. Under the government of Carlos Menem, the legislature passed rules designed to liberalize the economy and attract foreign investment. The main milestones in these first years were the startups of Bajo de la Alumbrera (1997), a gold-copper mine today operated by Xstrata, and AngloGold Ashanti's Cerro Vanguardia gold-silver mine, which has been in production since 1998.

Since then, the sector has had its ups and downs. First, there was the financial crisis in 2001-2002 that brought the country's economy to its knees and saw five different presidents rule Argentina in just a month. After that Barrick's Veladero, a \$2 billion investment, became the country's largest gold mine. In 2008-09 it was the turn of Western markets to collapse, leaving the sector short of the necessary cash to invest in exploration. Exploratory drilling in Argentina decreased from the record of 668,000 m in 2008 to 570,000 m in 2009, according to the Argentinean Chamber of Mining Entrepreneurs (CAEM).

This last crisis, however, did not prevent the opening of several new mines in

2008-09 including Yamana Gold's Gualcamayo (gold), Pan American Silver's Manantial Espejo (silver-gold), Silver Standard's Pirquitas (silver) and China Metallurgical Group Corp.'s (MCC) Sierra Grande iron ore mine. Moreover, the huge bi-national Pascua Lama project is now under construction by Barrick; Brazil's Vale is making a multi-billion dollar investment in potash; and as the world seems to have left the worst part of the subprime crisis behind, the prospects on the exploration side look much better now, with renewed dynamism from junior companies already noticeable during 2010.

## Growing Pains and Legal Aspects

Argentina has traditionally been an agricultural country endowed with a large, century-old hydrocarbons industry (today in decline). Metals mining is the latest large sector to be developed, even if some pioneering operations, such as Mina Aguilar and Mina Pirquitas, were already up and running in the first half of the 20<sup>th</sup> century. "Mining exists in Argentina since the creation of the Argentinean Republic, yet modern mining only started 15 years ago. The good thing about being a new industry

is we have the latest technology available," said Manuel Benítez, president, CAEM.

The problem is not everyone sees the new industry with positive eyes. The sector has been the target of never-ending campaigns that have transformed open-pits and cyanide into things to be hated, as producers have failed to explain that without mining, people could not have a mobile phone, a car or even electricity. Being a heavily politicized country, Argentinean congressmen and provincial governors have not taken long to include anti-mining initiatives as part of their political agenda. This is a result of either environmental concerns, a lack of knowledge about the industry, or often a mere strategy to gain votes.

Moreover, Argentina is a federal country where the provinces are the owners of their natural resources. The procedure for the approval of environmental studies is undertaken at the provincial level, but more importantly than this, some provinces have enacted laws over recent years that are equivalent to an upfront ban of certain mining activities; notably the prohibition of using cyanide in mining processes.

"When an investor goes to two different provinces, it would seem he goes to two different countries," said Leonardo Rodríguez, lawyer, Marval, O'Farrell & Mairal.

Adolfo Durañona of Baker & McKenzie agrees. "If all provinces were as pro-mining as San Juan and Santa Cruz, the mining map of Argentina would be radically different."

The two main arguments used against the mining industry in Argentina are mining has an unbearable environmental impact, and the mining sector does not pay enough taxes. The prohibition of using cyanide in provinces like Chubut and Mendoza has left very good projects on hold, at least for now.

"These laws contradict the constitutional right to develop a lawful industry. Prohibiting the use of cyanide for mining, while it is legal in any other industry, is a clear discrimination without cause and is unconstitutional. Considering our current

laws and regulations for environmental protection, there are no technical or legal arguments to substantiate such initiatives," said Ignacio Celorrio, lawyer, Quevedo Abogados and president of the Argentinean Chamber of Uranium Companies (CADEU).

With regard to the taxes debate, Rodríguez explained taxes are nothing if compared with the impact mining brings in employment and technology development. The sector, he argues, creates four indirect jobs for every direct job.

According to governmental data, the industry employed 272,500 people in the country in 2009 (direct and indirect jobs), while in 2003 the figure was just 98,700. In spite of this positive impact, some mining companies saw their 30-year tax stability contracts broken in 2007 when the government approved tax retention on mining exports.

Considering all of these aspects and its federal structure, how mining-friendly is Argentina as a whole? "I do not think having different approaches to mining is a killer for Argentina and it is probably unfair the country is ranked so low in surveys like the one of the Fraser Institute. If you look at Canada or the U.S., you have big differences between states. Nevada is not California; Alberta is not British Columbia. Argentina as a whole ranks worse than Chile or Peru, but if you take San Juan as a jurisdiction, the situation is very different," said Hernán Zaballa, a lawyer at Brons & Salas.

San Juan, a western province in the Andes, home to the Veladero and Gualcamayo mines, is indeed a remarkable example of economic development. This is due to the wholehearted support given by José Luis Gioja, its governor, to mining investments. According to Gioja, the province's exports will amount to \$1.3-\$1.4 billion this year, 60%



In 2009, its first year of operation, Yamana Gold's Gualcamayo mine produced 143,000 oz of gold. (Photo courtesy of Yamana)

of which will be from mining (total exports from San Juan were just \$146 million in 2003). The governor does not lack arguments to defend his pro-mining policies. "Provinces legislating against mining developments do not have an urgency to provide opportunities for their population. Yet in my province if we did not have mining 300,000 people that directly or indirectly make a living from the industry would have to go somewhere else. Besides, with the income provided by mining companies we have created a fund to finance infrastructure and social projects like roads and transmission lines."

### What's Next?

Production levels in Argentina are still negligible if compared with its potential. In copper, the country only ranked as the 17<sup>th</sup> largest producer in 2009; in gold, Argentina should make it to the world's top 15 in 2010 thanks to a significant output increase in Barrick's Veladero; and in silver, Argentina was the 12<sup>th</sup> largest producer

last year. In all of these metals there are significant projects in the pipeline, including the aforementioned Pascua Lama binational project (Chile-Argentina) and the Navidad project, recently acquired by Pan American Silver, which is known as the world's largest unexploited silver deposit. For copper, it is expected Chile's enormous reserves will surely be replicated in many instances on the Argentinean side of the Andes range.

Argentina also has enormous potential in uranium and lithium, strategic minerals for which demand is expected to rocket with the construction of new nuclear reactors worldwide and the popularization of hybrid and full-electric cars in the next couple of decades. In the case of lithium, of which Argentina is already the world's second largest producer after Chile, the country is living a true boom in its northern provinces thanks to its abundance of lithium-containing salars (salt flats) where it can be produced at low costs.

## Laws Regarding Protection of Glaciers in Argentina

The Argentine Constitution entrusts the National Congress (ANC) with passing laws concerning minimum environmental protection standards and the provinces are entrusted with the passage of supplementary environmental rules and regulations.

Although glaciers did not lack protection under the existing legislation, in 2008 the ANC approved a first bill on Protection of Glaciers, under which (a) the notion of glacier is defined in a very broad sense to include the periglacial environment; (b) new activities in glaciers or periglacial zones that can affect them are prohibited, expressly including mineral and oil exploration and exploitation; (c) such prohibited activities in glaciers or periglacial zones are excluded from the evaluation of environmental impact that would allow evidencing the sustainable development of a certain activity; (d) Existing activities in glaciers and periglacial zones are subject to re-evaluation to determine if there is significant impact.

By Hernán Miguel Zaballa, Lawyer, Brons and Salas

This bill was vetoed by the Argentine president, who argued: (a) ANC does not have the constitutional powers to impose prohibition through the establishment of minimum environmental requirements, since this would be an invasion of provincial powers; (b) the prohibition of the activities may impair the economic development of some provinces and hinder the performance of any kind of activity or work in the Andean areas; (c) the provinces are the owners of the natural resources existing in their territories.

Recently, ANC has approved a new bill with a text that has a similar scope as the vetoed bill. This new bill will have to be considered by the Executive Power and if approved also subject to further regulation that will determine its final scope. In the meantime, some provinces (Santa Cruz, San Juan and La Rioja) have enacted provincial law for protecting glaciers, aiming to defend their competence and full exercise of their constitutional powers.

# Keeping a Low Profile was the Wrong Decision

*An interview with Dr. Jorge Mayoral, Argentina's mining secretary*

## How has the mining sector evolved under your stewardship?

This team is the result of hard work since the crisis Argentina suffered in late 2001-2002. When we arrived we analyzed its source. Argentina's development has always been based on a farming model in the pampa (prairie). The capital concentrates a high proportion of the population while some provinces in the interior are underpopulated and underdeveloped. We saw there were opportunities to halt the exodus from the provinces. The problem is many governments had never bothered to promote development in these provinces.

With Chile we share the second-longest political border, an Andean area that has allowed our neighbor to become the world's largest copper producer. How is it that Argentina had not taken advantage of its huge mining potential yet? Three days after I took over as mining secretary we decided to go to the Prospectors & Developers Association of Canada's conference to reassure investors. I asked them to give us six months grace to prove we would become a stable country. In this context Veladero was built and that was a turning point.

## What were your main political initiatives?

In the middle of the institutional chaos of those months, we decided to focus on Toronto, New York and London, and think long-term rather than focus on the crisis. We also presented our mining strategic plan with five main guidelines: to reactivate the national production of the installed capacity; to create a stable set of rules for foreign investors; to strengthen the international cooperation; to democratize the public information; and to be present in the international markets.

## With regards to the legal framework, some companies are not happy the 30-year tax stability approved in the 1990s was not respected in 2007 with taxes imposed on mining exports.

Argentina has made a great effort to help foreign investors. The 2001 crisis could have allowed us to do nearly anything. Yet in 2002-03 we implemented a number of measures looking at the long term that were

incredibly difficult to defend at home in the middle of the economic storm, like the free availability of currency for mining projects. The strategy was to attract investments.

At the last G20 summit in Toronto, our president made it very clear we are strongly promoting the mining sector in Argentina and the rules of the game are not going to be changed. We have recently been in Shanghai with the same message. And we have worked strongly in the recent Mercosur summit where the presidents of the continent highlighted mining development as a key factor for growth in the region.

## The Argentinean mining sector has expanded significantly over the last years. What is the potential for more growth?

In the middle of the subprime crisis, when some multinationals were shedding thousands of jobs, we assured everyone the Argentinean mining sector would continue growing. Some laughed at that idea, but the truth is we inaugurated four projects during 2009. Argentina has the resources for sustainable growth because the demand for minerals will remain strong.

In 2009, we launched the first bi-national mining project in the world. It was a huge challenge to harmonize the regulatory frameworks of two countries to make this project possible. Together with Chile, we have sent a message to the world. In 2009 we also advanced the Río Colorado potash project in Mendoza. Both are investments worth billions of dollars. While Toronto, New York and London will continue to be very important markets for us, we have also realized the BRIC economies will play an increasing role in our growth. Vale's investment in Río Colorado is the first development in this respect.

## Argentina has enormous potential, but some provinces see mining as a undesirable industry. What is your view on this issue?

Argentina is a federal country formed by the union of its provinces. The last reform to the Constitution was in 1994, when article 124 was reformed. This gave the provinces the right over the natural resources. Some of the provinces that had an anti-mining legislation have now



changed their approach, like La Rioja; and in the provinces that are still hostile to mining there are projects that will make politicians change their mind. I believe Mendoza will be the best example of that.

Argentina does not have a tradition of big mining. In this context, there are some industries that have based their success on the availability of cheap labor. When in these areas the mining sector offers better paid jobs under better working conditions and with no informality, the impact is enormous. Those workers who enjoy the benefits of joining the formal economy never go back to informality. This explains in some instances the anti-mining campaigns falsely based on environmental arguments. The problem is the mining sector in Argentina has not been proactive enough in communication initiatives. Companies have been wrong to keep a low profile because we have nothing to hide.

## What is your prediction for the future of Argentinean mining?

These are the times of Latin America because this continent has a number of resources the world needs. The world's agenda is actually quite reduced: food, water, energy and minerals, and Latin America has all of them. Argentina should become the world's key mining player by 2025 after receiving investments of \$30 billion, with a protagonist role in the production of copper, gold and silver, as well as lithium and borates; also it will be a key producer of potash.

"In the past, strategic minerals were a monopoly of the state, but now many companies are very active. In lithium we believe we can reach the same levels of reserves and production as Chile," said Julio Ríos, president, Group of Exploration Companies of Argentina (GEMERA).

Political uncertainty and the relationship with the local authorities and communities are the main challenges for the development of mining in Argentina. The geological potential is huge; the country is a paradise for geologists and there are several world-class deposits waiting for a more favorable environment. With regard to the shortage of service providers, this can be seen as a natural stage in the growth process and can be addressed relatively quickly as the industry develops.

"What the country is lacking is a framework to protect the investments in the field," said Ríos. "The timing of the mining industry is completely different than in other industries; it requires long-term investments. When you have countries like Peru and Chile that offer great geological potential and also have all of the needed infrastructure and service providers in place, we need to give something extra to be competitive."

The industry has already shown its will to make the most of Argentina's potential, the latest example being the \$3.4 billion announced acquisition of Andean Resources, owner of the Cerro Negro gold project, by Goldcorp. "Argentina's mining industry is growing and if we keep working in a responsible manner the perception of the people will surely change," said Dante Vargas, general manager, Veladero. Should the industry be able to overcome the political and social challenges, the next decade could be the mining decade in Argentina.



Julio Ríos, president, GEMERA.

## Pan American Silver Corp.

### Committed to Responsible Silver Mining and Sustainable Development in Argentina



#### Manantial Espejo Mine – Santa Cruz (Minera Triton Argentina S.A.)

- Argentina's 2009 Mining Company of the Year by Panorama Minero
- Making a difference for over 650 employees

#### Navidad Project – Chubut (Minera Argenta S.A.)

- Largest undeveloped primary silver deposit in the world
- Already providing direct employment to over 190 individuals



**Pan American**  
SILVER CORP.

625 Howe Street, Suite 1500, Vancouver, BC, V6C 2T6  
Tel (604) 684-1175 Fax (604) 684-0147  
[www.panamericansilver.com](http://www.panamericansilver.com)

# Argentina—On the Map of Multinationals

*Argentina's potential has crystallized into a handful of mining operations since the mid-1990s. The prospects for new deposits mean the country can no longer be ignored by the world's largest producers.*

There are only a dozen metallic mines in Argentina: really not much for an Andean country whose territory is the eighth largest in the world and whose mineral richness is phenomenal. It is reasonable to think the country could become a large producer of gold, copper and silver within the next 10 to 20 years.

Currently the only copper producer is Minera Alumbra, a joint venture of Xstrata (50%), Goldcorp (37.5%) and Yamana (12.5%), who operates the Bajo de la Alumbra mine in the Catamarca province through an agreement with YMAD, a governmental entity that owns the deposit.

Alumbra produced 156,000 metric tons (mt) copper and 450,000 oz gold in 2009, although due to lower grades these figures are predicted to fall to 152,000 mt copper and 435,000 oz gold (380,000 oz in concentrate and 55,000 oz in doré). With current reserves the mine will be in operation until 2016, but the company intends to extend its life. Alumbra has had a molybdenum plant since 2008 from which the company expects production to reach 650 mt this year.

Xstrata is also the owner of the El Pachón copper project in the province of

San Juan, a bi-national project near the Chilean border, yet it is not clear if the company will take it into production. The decision by the Argentinean government to break the tax stability agreements has not helped.

"Last year we increased our reserves by 41% and we continue updating the economic feasibility and the environmental impact assessment. It could be a larger project than Alumbra," said Julián Rooney, vice president, Xstrata Copper. "Argentina is very attractive for its geological potential. It competes with Peru and Chile to attract new investments, therefore it is fundamental the rule of law is respected and there is stability. Right now Peru is the main growth driver for Xstrata, thanks to the excellent conditions this country has created."

If developed, El Pachón would not be the first mine in San Juan, a province seen as the flagship of mining in Argentina. Close to the Chilean border, between 3,800 and 4,500 m above sea level is Veladero, one of Barrick's largest gold mines. The operation is significantly increasing its output this year (from 611,000 oz gold in 2009 to more than 1 million oz gold 2010) attributable to higher grades and an expanded crushing facility now running at 85,000 mt/d.

Dante Vargas, general manager, Veladero, commented on the challenge of running a mine in such a difficult location. "You need your people and your equipment to perform well at -30° C," said Vargas. "At any moment there can be 1,000 people in the complex, it is an enormous logistics effort. We are happy we can work in these conditions and with good safety results."

Veladero, a mine that has dramatically boosted the economy of the province, has the world's highest situated wind turbine. "Veladero is 100% dependent on its own generators (mostly diesel-based), and going for wind power was a decision with the aim to switch to renewable sources. The wind mill, in operation since late 2008 is a 2 MW, \$8 million prototype that covers 15% of Veladero's energy needs," said Vargas.

Barrick is also strengthening its presence in the country with the development of Pascua Lama, a \$3 billion investment between Chile and Argentina (also in the San Juan province). The deposit has proven and probable reserves of 17.8 million oz gold containing 671 million oz silver. The commissioning of the facilities, already under construction, is expected in 2012. The lifespan of the mine will be at least 25 years.

After Veladero, San Juan's second gold mine is Yamana's Gualcamayo, in production since last year. Output in 2009 was 143,000 oz gold and this year it will reach 160,000 to 180,000 oz approximately. "Gualcamayo has been a great acquisition for Yamana," said Hernán Vera, vice president and country manager, Yamana. "The first year has been very rewarding with the added benefit that the mineral reserves and mineral resources are constantly growing. Currently the life of the mine is nine years, but we are drilling about 10,000 m per year to increase the mineral resources."

Yamana also owns the large Agua Rica project that has encountered some problems with the locals in the province of Catamarca. Providing a solution is reached and the social license is obtained, Agua Rica seems to be a high priority for



Veladero will produce more than 1 million oz of gold in 2010. The mine has the world's highest-situated wind turbine. (Photo courtesy of Barrick)



Eduardo Landín, general manager of Hochschild Mining-operated Minera Santa Cruz.

Yamana. The company is looking for a strategic partnership to develop this large project with an estimated mine life of 26.5 years and expected production of 148,000 oz gold and 168,000 mt copper during the first 10 years.

Finally, Yamana also owns Esquel in the province of Chubut, a project previously owned by Meridian Gold which was rejected by the local population in a vote in 2003. Sources at Yamana point out Esquel could be developed as an underground operation without leaching pads, yet there is no specific information about the future of the project which right now is on hold.

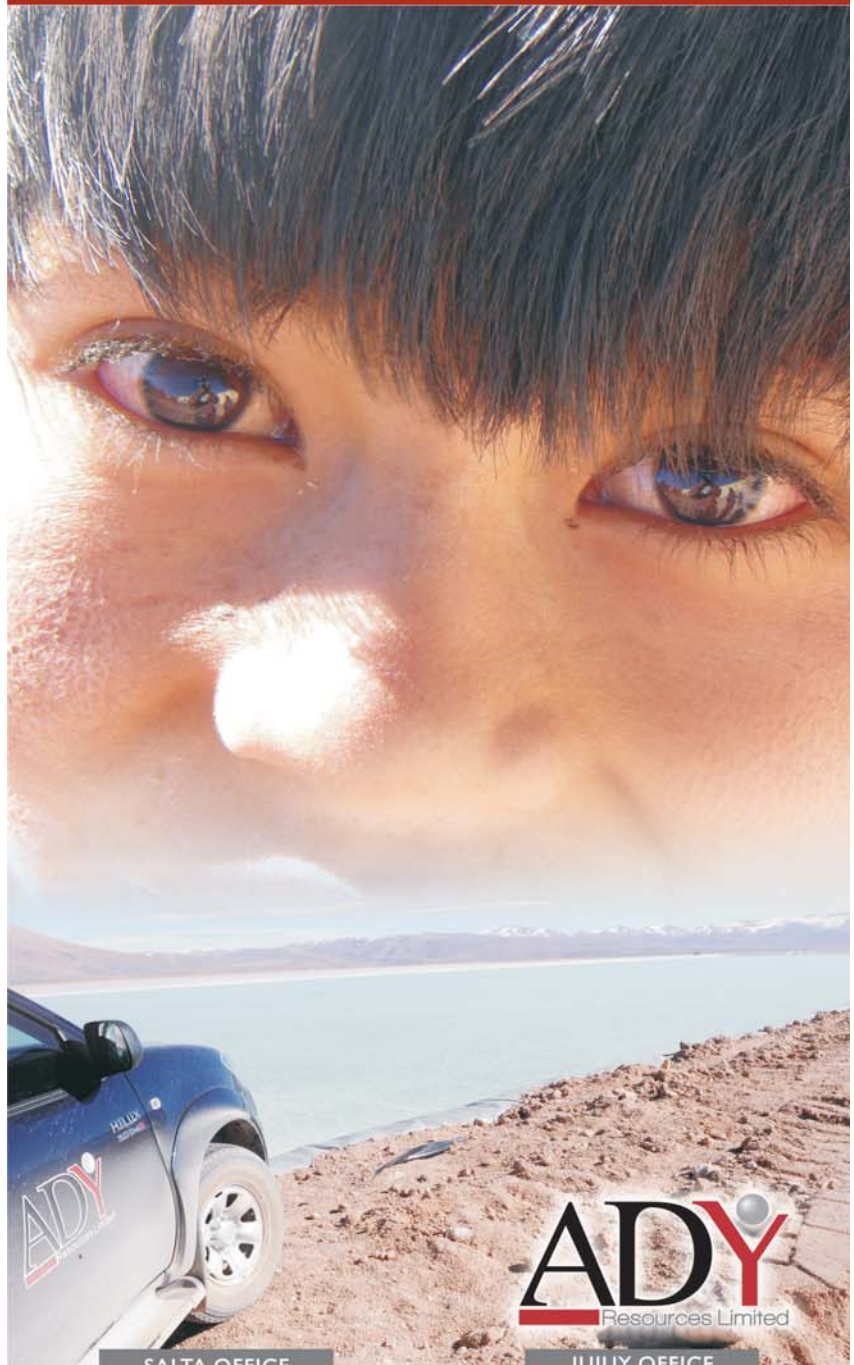
The province of San Juan will have a third gold mine this year, thanks to Australian junior company Troy Resources. It is adding the Casposo project to its production portfolio (alongside other assets in Australia and Brazil). "The estimate to build the project was initially very high, but we imported a processing plant we had bought in Australia a few years ago," Ken Nilsson, director of operations, Troy Resources said. "Thanks to this we were able to halve the estimated capital expenditure. It is probably the first time anyone has imported a second-hand plant to Argentina."

The company is about to pour first gold at Casposo (company sources have predicted the first few days of October 2010), a significant achievement considering it only bought the project from Intrepid Minerals in May 2009. Size-wise the operation is not very big, the processing capacity is 400,000 mt/y, for an output of 320,000 oz gold and 9 million oz silver during a mine life of at least six years. "With the potential for more reserves I expect the



Ken Nilsson, operations director, Troy Resources.

We have more than a reason...  
to work towards  
the development of the Argentinean Puna



SALTA OFFICE

JUJUY OFFICE

Santiago del Estero 282 - Tel.: +54 387 432 1301

Luis Burela Este N° 48 - Tel.: +54 388 425 9081

E-mail: [contacto@adysalta.com](mailto:contacto@adysalta.com)

E-mail: [contacto@adyjujuy.com](mailto:contacto@adyjujuy.com)



## PRODUCING ASSETS THROUGH ACQUISITION, EXPLORATION AND DEVELOPMENT



Cerro Cazador S.A., a fully owned company of Hunt Mining Corp., is a mining exploration company very active in the Patagonia region, in Southern Argentina. We are involved in the exploration and developing stage of several precious metal deposits, such as La Josefina Project, Bajo Pobre Project and El Gateado Project, all them located in the Deseado Massif, in the Santa Cruz Province, Argentina.



CERROCAZADOR S.A.  
PARANÁ 275, PISO 3, DPTO. 6.  
(C 1017AAE) BUENOS AIRES  
REPÚBLICA ARGENTINA  
TEL: (011) 43750758

**HUNT  
MINING**

mine to be operating for 10 to 15 years," Nilsson said. "It all depends on metal prices, but we are very optimistic. In the year we have been here, we already have dramatically increased our ore body and resources." The company, which has contributed \$14 million to the government of San Juan for the construction of a transmission line, will employ 99% of its workers from within the province.

### Mining in Patagonia

The province of Santa Cruz is the other main mining jurisdiction with significant production of gold and silver. The oldest operation is Cerro Vanguardia, a joint venture between AngloGold Ashanti (92.5%) and Fomicruz (7.5%), an entity owned by the provincial authorities. Since its startup in 1998 the grades have decreased and the company has had to expand throughput and metallurgical recovery to maintain production levels. The mine, initially designed to last until 2008, now has reserves until 2018. This year's production will be more than 200,000 oz gold and 2-2.5 million oz silver.

Through "in-pit mining" (i.e. going underground when the stripping ratios become uneconomical) and the heap leaching of low grade mineral piled up in previous years, the company plans to increase its gold production by 25% to 250,000 oz per year. Jorge Palmés, vice president Argentina and country manager, AngloGold Ashanti, explained how the South African company is going to increasingly rely on Latin America. "South Africa is a traditional gold producer, but its reserves are becoming more difficult to extract," Palmés said. "The American region offers lots of potential and our aim is



Jorge Palmés, general manager, Cerro Vanguardia.



that the share of our division within the company's global production will increase from the current 18% to 25%. Argentina has become a very attractive alternative to the higher costs of production of some other areas of the world. Our idea is definitely to grow in the country."

Santa Cruz hosts two other silver mines: Pan American Silver's Manantial Espejo and Minera Santa Cruz' San José mine. A third one, the Martha mine operated by Coeur d'Alene Mines, is shutting down this year (it produced 3.7 million oz silver and 4,700 oz gold in 2009).

Manantial Espejo, a \$230-million investment in production since late 2008, expects to contribute 4 million oz silver and 60,000 oz gold this year to Pan American Silver's overall production, which includes mines in Mexico, Bolivia and Peru. The mine has a dual exploitation operation with open-pit and underground mines active at the same time. At current reserves the mine life is eight years, but the company is actively exploring to expand its resource base.

Pan American Silver also has another key asset in Argentina: Navidad, one of the world's largest undeveloped silver deposits, acquired from Aquiline last year and which could become the company's flagship project. Yet the Chubut province, where it is located, still needs to decide where they will allow open-pit mining and where they will not.

"Navidad is a relatively large tonnage and medium grade deposit that should be developed as an open-pit operation," said Bret Boster, country manager, Pan American Silver. "It lies in an area of the plateau that has a very low population density and lacks infrastructure. Therefore the project could be a key contributor to the economic stimulus of the region."

If Navidad is given a green light, Argentina will become the most important country for the company, a significant milestone for an organization that has developed four projects in four years and that accumulates 14 years of consecutive growth in silver production. "Argentina is emerging as a significant silver player," Boster said.

Back in Santa Cruz, another significant silver mine in the province is San José, operated by Hochschild Mining, the majority partner with 51% in joint-venture company Minera Santa Cruz. The remaining 49% is with Minera Andes of Canada. The mine started in mid-2007 with a processing capacity of 750 mt/d, which was expanded to 1,500 mt/d a year later. Production in 2009 was 5 million oz silver and 77,000 oz gold. Reserves will last for another eight years with current production rates, although the company carries out 23,000 m of diamond drilling annually to prolong the lifespan of the mine.

Besides the plant expansion, Minera Santa Cruz decided to invest \$21 million in a high-voltage transmission line to be connected to the grid, an investment



Bret Boster, country manager, Pan American Silver.



## TROY RESOURCES NL

### Looking to Invest in Gold?



Troy Resources NL is a dividend paying gold producer with operations at Sandstone in Western Australia and the Andorinhas Gold mine in Para State, Brazil and the exciting Casposo gold-silver project being developed in Argentina.

The Company has forged a proven record of fast-track mine development, low cost operations, strategic acquisitions and exploration discoveries.

Troy is dual-listed on the Australian and Toronto Stock Exchanges (code: TRY).



#### Troy Resources NL

**Contact Person:** Paul Benson, CEO  
Ground Floor, 44 Ord Street, West Perth, WA 6005  
**T:** +61 8 9481 1277 **F:** +61 8 9321 8237  
**E:** troy@troyres.com.au **www.troyres.com.au**

which benefited the mine as well as the local population in the area of Perito Moreno. The company is also implementing a safety management program with the aim of achieving a zero-accident rate. "Our incident frequency rates have been decreasing and this is paramount to us. At the end of the day, mining is quite new in Argentina and workers do not have much experience, therefore as an employer we need to provide the safest environment possible," said Eduardo Landín, general manager, Minera Santa Cruz.

Another primary silver company with a producing asset in Argentina is Silver Standard. The Vancouver-based company put the Pirquitas site (a historic mine in the province of Jujuy, northern Argentina) into operation in 2008, representing a first success which the company wants to replicate with other advanced ventures it has in Peru and Mexico, as well as in Argentina's Diablillos project.

"Our production expectation for 2010 is 7 million oz silver and as we ramp up the operation the mine will produce between 8 and 10 million oz/y, depending on the grades," said George Paspalas, COO, Silver Standard. "In Q1 2010 we generated our first zinc concentrate from the silver circuit



George Paspalas, COO, Silver Standard.

and we now have a tin circuit operating as well. Current mine-life is 14.5 years, but we know there is a lot of potential for more reserves."

Also in Jujuy, is Minera Aguilar, in operation continuously since 1936. Today part of the Glencore group, the activity of the polymetallic mine (producing 65,000 mt of zinc concentrate and 25,000 mt of lead concentrate with silver content) is complemented by a lead-silver smelter, also in

Jujuy, and a zinc smelter, close to the city of Rosario.

Roberto Cacciola, executive vice president, Minera Aguilar, believes one major challenge to operating in Argentina is the country's inflation rates of more than 20%. Furthermore, one of the greatest obstacles for mining development, he believes, is the lack of information available to the average citizen about the mining sector. "In Esquel, for instance, there was a very effective, low-cost campaign, implying that if Esquel was developed people would be drinking cyanide in their tap water, which is a blatant lie," Cacciola said. "But it resulted in an 80% majority voting against the project. Mining companies in Argentina are taking too long to react to these campaigns."

Boster agrees. "Social acceptance is one of the critical points today in successfully developing a mine," he said.

Obtaining it from the beginning is key as some companies have learned the hard way. Honesty, transparency and education initiatives, as well as more proactive communication efforts to tackle false allegations by anti-mining activists, seem necessary for success. If mining players conduct projects in the right way there will be mining in Argentina for many years to come.

**CERRO VANGUARDIA**

**Our Vision is to be the Leading Mining Company**

**ANGLOGOLD ASHANTI**

Certifications:  
ISO 9001 / 2008, ISO 14001 / 2004, OHSAS 18001 / 2007

Av. San Martín 1032, (9310) Puerto San Julián, Santa Cruz  
Yacimiento: T - (02962) 496000 F - (02962) 496088  
Puerto San Julián: T - (02962) 496260 F - (02962) 496261

# A Top Exploration Destination

*Argentina's vast territory offers unmatched geological potential. As the industry overcomes the financial crisis, companies dedicate funds to exploration, while advanced projects become new mines.*

Coupled with strong commodity prices, Argentina is experiencing a new exploration boom. Between 2003 and 2008 the number of meters drilled increased fourfold (166,000 m to 668,000 m) only to decrease in 2009 due to the crisis. Now industry leaders are once more very optimistic. There are players with advanced projects as well as a handful of grassroots exploration companies. According to Julio Ríos, president of exploration trade association GEMERA, 75% of Argentina's land with geological potential remains unexplored.

For Lucas García, lawyer at Baretta Godoy, it is the right time to invest. "Whoever builds up a good portfolio of projects now will have an invaluable advantage in 10 to 15 years time," García said.

When it comes to gold, silver and copper, most of the juniors are putting their money in provinces with a favorable framework to mining, especially Santa Cruz, San Juan and Salta.

## Santa Cruz: The Potential of the Deseado Massif

Santa Cruz, in the Patagonia region, is currently a hot destination. It hosts the Cerro Vanguardia gold mine as well as advanced gold projects including Andean Resources' Cerro Negro, Extorre Gold Mines' Cerro Moro and Minera IRL's Don Nicolás, all located in the Deseado Massif. Discoveries in the area have acted as a magnet for grassroots exploration companies.

Cerro Negro has recently switched hands as Goldcorp of Canada has acquired Australian company Andean Resources for a substantial \$3.4 billion. Cerro Negro has indicated resources of 2.5 million oz gold and 23.5 million oz silver, with additional inferred resources.

Before the announcement of the merger, Alberto Carlocchia, director of legal and institutional affairs at Oroplata, Andean's Argentinean subsidiary, provided a more detailed account. "We are considering an annual output of up to 285,000 oz gold for the first five years and a mine life of 10 years initially; a period that should be

extended," Carlocchia said. "We are going to start with the Eureka target, which contains more than 1 million oz and is quite deep. The Bajo Negro target is also underground. The Vein Zone would be an open-pit operation, although this should come into the mine plan much later in the project. The average grade of the Eureka and Bajo Negro veins is between 8 and 12 grams per ton." Andean's estimated capital investment to build the mine is \$275 million.

Extorre Gold Mines is a spinoff of Exeter Resource's Argentinean assets, Cerro Moro currently being the most important one. The gold-silver project has an indicated resource of 612,000 oz gold equivalent (357,000 oz gold and 15.3 million oz silver) and an inferred resource of 390,000 oz gold equivalent, all from the Escondida vein with an average grade of 32.3 g/mt gold equivalent. "Cerro Moro is a high grade gold-silver project which we should be able to put into production for a relatively modest cost—perhaps around \$100 million—and within a relatively short time frame," said Eric Roth, president and CEO, Extorre. If there are no permitting issues, Roth expects to see first metal production in the second half of 2012. State entity Fomicruz will have a 5% stake in the project.

Another upcoming mine in the Deseado Massif is Don Nicolás, a project that Peruvian-based Minera IRL acquired through the takeover of Hidefield Gold. The company is currently taking the project through feasibility with a 360,000 oz gold resource (indicated plus inferred). The idea is to put the mine into production by late 2012 and to have an annual output of 60,000 oz/y gold.

## Exploration

Due to a mining-friendly framework and great geological potential, the province of Santa Cruz seems to be securing a number of successes in the medium term. One of the latest grassroots discoveries in the area is Las Calandrias, a project that has significantly raised the profile of its owner, Mariana Resources. "Las Calan-

drias was a very rapid development for us," said Gustavo Rodríguez, exploration manager, Mariana Resources.

"It was staked as open ground in April 2008 and the discovery was confirmed in follow-up drilling earlier this year," Rodríguez said. "We now have another 10,000 m ready to go, so we are aiming for a maiden resource in late 2010 or early 2011. It is an unusual deposit for Santa Cruz, in that it has both bulk tonnage potential at Calandria Sur and bonanza vein potential at nearby Calandria Norte."

Mariana has other properties elsewhere in Argentina as well as in Chile, yet the province of Santa Cruz, where it also has Sierra Blanca (a joint venture project with IAMGOLD) is the main focus of the company right now. "Years ago agriculture was important in Santa Cruz but in 1991 a volcanic eruption reduced sheep farming drastically with a blanket of ash over the province. The development of the mining industry is filling the gap," Rodríguez said.

Another company active in Santa Cruz is Hunt Mining through its Argentinean subsidiary, Cerro Cazador. Its main project is the 91% owned La Josefina gold-silver project, currently with a resource of 204,117 oz gold equivalent (indicated plus inferred). The company is currently investing around \$3 million to certify the pre-existent data on the property, while it is also waiting the answer to its \$5 million offer to participate in Fomicruz' Valenciana project.

"In the period of the colony there was exploration by the Jesuits in the center and north of Argentina, but not in Santa Cruz," said Hunt Mining's General Manager in Argentina, Danilo Silva. "This is why there are so many areas that are completely unexplored. The potential of the Deseado Massif has materialized since the discovery of Cerro Vanguardia and the development of the San José and Martha mines, while Cerro Negro and Cerro Moro, two high-grade projects, are close to production. High-grade guarantees stability because projects are feasible even at crisis times."

"In the plateau there are no high altitudes and the road infrastructure is very good so entrance costs are not very expensive," Silva said. "We are persuaded that Santa Cruz is the place to be."

The poly-metallic nature of Hunt Mining's La Josefina project is replicated in other parts of Santa Cruz, even with some surprises. Argentex Mining's Pingüino project, for instance, also contains indium, a strategic mineral used in flat screen TVs or thin-film solar cell technology. "Pingüino is unique for several reasons. The strangest thing is that the poly-metallic has indium content," said Ken Hicks, president of Argentex Mining.

"There are only seven examples of epithermal indium projects in the world. After we discovered the indium in 2007, many companies started to look for this mineral in Patagonia, but none have found similar amounts," Diego Guido, technical advisor said. The project already has an initial 43-101 resource estimate.

At the grassroots level, a significant company in Santa Cruz is Mirasol Resources, whose team did the first helicopter reconnaissance in the province in the 1990s. According to Timothy Heenan, exploration manager and director, the aim of Mirasol is to look for brand new prospects and bring

them up to first phase drilling. The company has relied on a number of joint ventures since its foundation in 2003, but as it receives more solid financial support from investors it expects to develop more projects on its own, Heenan said.

## Other Provinces

The northern areas of the Andes also offer excellent potential. In San Juan, there is no better evidence of this than the Veladero, Gualcamayo and soon Casposo gold mines. Mendoza, traditionally the preferred working base for mining companies exploring in the Andean area, is currently experiencing a slowdown due to the anti-mining regulations that have put sizable projects (like Extorre's Don Sixto, which contains 1.2 million oz gold, all categories) completely on hold.

The fact that exploration can be a profitable business for junior companies in Argentina is something the Lundin Group (who discovered Veladero) and the Grosso Group (who discovered Gualcamayo and Navidad) can easily relate to. Golden Arrow Resources, one of the Grosso group companies, receives a 1% royalty (NSR) from Gualcamayo and is focusing on its Potreros project, just a few kilometers away from Veladero and Pascua Lama. "The

Valle del Cura is one of the most mineralized places in the world right now. About 45 million oz gold equivalent have been discovered there, and we know that there are other projects in the valley that are close to resources that are fantastic," said Bruce Smith, exploration manager, Golden Arrow.

Similar to San Juan, the province of Salta (northern Argentina) is undergoing rapid mining development. On top of hosting impressive lithium reserves together with neighboring provinces Jujuy and Catamarca (see following article), it also has interesting metallic projects: Golden Minerals' El Quevar (silver), Mansfield Minerals' Lindero (gold), Silver Standard's Diablillos (silver) and Lumina Copper's Taca Taca (copper).

El Quevar is on its way to becoming Salta's first metallic mine. "We have done a significant amount of work in less than a year, nearly tripling the mineral resource," said David Drips, project director, Golden Minerals. "The project currently has a production life in the seven-year range and the deposit continues to grow. If all goes well, we could be pouring silver in Q1 2012."

The latest resource estimate at El Quevar's Yaxtche deposit is close to 9 million oz silver (indicated) and 51.5 million oz silver (inferred), with a small copper content. El Quevar's plant, initially designed to process 800 mt/d, will be situated at 4,200 m above sea level with the mine's portal (already completed) at 4,800 m. "The biggest challenge is the altitude and its effect on our personnel and equipment," said Drips.

The highly-advanced Lindero gold project of Mansfield Minerals has a measured and indicated resource of 2.2 million oz gold and further inferred 750,000 oz gold. The company, active in Argentina since 1994, is

## Ground Breaking



**ASX/TSX: AND**

For more information,  
please contact Krista Muhr

In North America: 647.330.1478

In Australia: 0448 886 460

krista.muhr@andeangold.com

[www.andeangold.com](http://www.andeangold.com)



**Andean**  
resources



Danilo Silva, president of Hunt Mining's subsidiary Cerro Cazador.

# Healthy Smiles

Barrick is proud to assist our host communities and countries in improving quality of life in areas where it has the capacity and ability to do so.

With Barrick's support, three dental clinics in the communities of Las Flores, Tudcum and Rodeo, in the province of San Juan, Argentina, have been fully equipped.

In addition, during the past three years, over 1500 children have benefited from Barrick's Oral Health Program in Iglesia which, with the support of health institutions in San Juan, has achieved significant improvements in dental care.

This unprecedented program consisted in educational talks at all schools on the importance of good eating habits and oral hygiene and in providing dental check-ups and topical fluoride for each child.



**BARRICK**  
Responsible Mining

Minera del Altiplano S.A.

FMC Lithium



Ejército del Norte 20  
A4406BKN Salta, Argentina  
Tel: 0054 387 4322100  
Fax: 0054 387 4322150

Esquiú 591 Piso 2  
K4700BIK San Fernando del V. de Catamarca  
Argentina  
Tel/Fax: 0054 3833 433222

doing the feasibility study and plans to find a partner or buyer for the project, although managers do not rule out becoming producers. According to current data, putting Lindero into production would cost approximately \$200 million. Mansfield's Senior Geologist Facundo Huidobro describes Lindero as a "by-the-book project."

Huidobro also manages other exploration projects by Pachamama Resources (a spinoff designed to leave Lindero with all the attention of Mansfield) and is president of the Mining Chamber of Salta, a province where the industry is growing so fast that there is a shortage of providers. "We have a challenge to find goods and services, as well as trained professionals. We recur to Chilean providers for what we cannot source locally. San Juan is better positioned in this respect," Huidobro said.

### Copper: Not Just Alumbrera

Currently Bajo de la Alumbrera is the country's only copper producer, but there are several projects that should improve Argentina's position in the red metal in the medium term. Another project in its final stages is San Jorge, a Lumina Copper property optioned to Coro Mining, who intend to acquire 100%. Although the beginnings were difficult, with the province of Mendoza forbidding the use of sulphuric acid in mineral processing, the company has developed an alternative method of exploiting San Jorge by leaving the production of oxides aside, until the legal framework permits it. With regard to sulphides, Coro expects annual production of 40,000 mt copper and 39,000 oz gold during a 16-year mine life. Providing the EIA is approved in the coming months (in Mendoza EIAs have to be sanctioned by the legislature), the company will go ahead with an estimated \$277 million investment. "We plan to use thickened paste technology to save on water usage. Just the flotation plant will show the people in Mendoza that responsible mining is possible," said Julio Ortiz, director of Coro's Argentinean subsidiary.

In neighboring San Juan, Xstrata boasts the sizable El Pachón project, while there are other endeavors including Peregrine Metals' Altar and Minera Andes' Los Azules. The latter underwent 10,000 m of drilling during the last season.

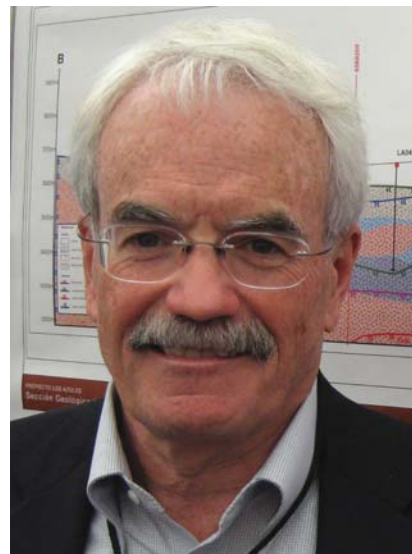
Minera Andes has updated the resource estimate at Los Azules to the current 2.2 billion lb copper (indicated) and 10.3 billion lb copper (inferred), with small gold and silver

contents. "We expect to have the preliminary feasibility study by the end of 2011. Los Azules is a very large project, therefore we will benefit from economies of scale," said James Duff, COO, Minera Andes.

Further north in the province of Salta, Lumina Copper is now concentrating its efforts on the old Taca Taca porphyry project, after a successful series of transactions of other copper projects in the Americas. So far Taca Taca contains an inferred resource of 8.7 billion lb copper, 2.9 million oz gold and 333 million oz molybdenum. "In terms of alteration it is one of the largest known porphyry systems in the world," said David Strang, president and CEO, Lumina Copper, who praises the provincial government of Salta for its support with the project.

Argentina's increasing potential for copper is attracting investment from large international players. Japanese JOGMEC, for instance, has the right to acquire 40% of NGEX Resources' José María copper-gold project. NGEX belongs to the Lundin group, who in the past discovered Veladero from scratch and sold it to Homestake in a profitable operation. "Due to this track record, Argentina is definitely an attractive country for NGEX and currently takes about 30% of the company's annual budget," said Diego Charchaflié, regional manager, NGEX.

Chile may offer a more secure legal framework than Argentina as a whole, but the latter enjoys great political support from certain provinces, and a more or less virgin geological map to be explored. As recent history has shown, those willing to invest in the country have the opportunity to be rewarded accordingly.



James Duff, COO, Minera Andes.

# The Strategic Minerals Advantage

*Many believe demand for lithium and uranium is set to rise significantly. Argentina has plenty of both.*



The Argentinean puna is set to become a key supplier of lithium to the world. (Photo: Salar del Rincón, operated by Ady Resources)

One particular aspect of Argentina's emergence as a mining destination is its richness in two strategic minerals whose future fundamentals look promising. For starters, nuclear power generation is more attractive than a few years ago. According to U308 Corp., a junior exploring for uranium in South America, nuclear power generation will grow 75% from 2007 to 2035 worldwide. Sources at UrAmerica, another junior company, estimate there will be a uranium supply deficit from 2015.

The Argentinean state, through the CNEA (National Commission of Atomic Energy), used to produce uranium to feed its nuclear power generation capacity, but somewhere along the line importing it became cheaper than producing it domestically. Now the situation has changed. "Current prices mean that new production projects in Argentina are potentially viable," said Ignacio Celorrio, president, Argentinean Chamber of Uranium Companies (CADEU).

The fact that Argentina has plenty of uranium has not gone unnoticed among the world's major producers. Earlier this year Cameco signed a letter of intent with Calypso Uranium by which it could acquire 51% of Calypso's Argentinean subsidiary Energía Mineral in four years. "With this agreement we are not just a junior player, but a company with more solid feet and a world-class partner," said Guillermo Pensado, vice president of exploration, Calypso Uranium.

"There are not enough uranium-specialized geologists in Argentina. You can find uranium on the surface, which you are no longer able to in areas such as the U.S.," said Pensado.

Nascent uranium exploration companies have a lot of work ahead, Pensado explained. "In the 1960s and 1970s, CNEA carried out very good exploration programs, until they discovered Sierra Pintada in Mendoza and Cerro Solo. Then they virtually stopped any further exploration. Between 1955 and 2005, for every meter drilled in

Argentina in uranium exploration the U.S. drilled 500 m."

Currently the main focus of Energía Mineral is in the province of Neuquén (center-west) at the Central Block and Campesino Norte areas (covering 250,000 hectares between the two). The company also has properties in other provinces including Mendoza and Chubut, as well as interests in the U.S.

Also in Chubut, close to the CNEA's Cerro Solo deposit, privately-owned company UrAmerica is carrying out a 40,000 m drilling campaign. The company has set itself a target of discovering 15 to 20 million lb  $U_3O_8$  per year with a minimum 3,000 parts per million (ppm), for a total resource of at least 150 million lb in 10 years, according to the company's Chief Executive and Financial Officer, Omar Adra. UrAmerica currently controls 310,000 hectares between its own properties and joint ventures and plans to become a producer from 2013-14.

Adra is convinced demand for uranium will rocket. "China already imports between 5 and 6 million lb of uranium per year. By 2020, they will need 75 to 80 million lb, which is huge if you consider that today's production worldwide is just over 100 million lb," Adra said.

For Adra, the word "nuclear" still has negative connotations, but this should change as nuclear power becomes more important. "When Bill Gates said there would be a PC in every home, people thought he was crazy," Adra said. "Today, if we say uranium will be a key player in the world's energy matrix people may think that we are crazy. The truth is the world is growing and this goes hand in hand with growing energy demand."

As well as Calypso Uranium and UrAmerica, there are several other players. Blue Sky Uranium, a company created in 2005 as part of the Grosso Group, was the first ever company to search for uranium in Río Negro, where their Anit project is now located. Then there is U308 Corp., a company with properties in Argentina, Colombia and Guyana.

In Argentina, U308 Corp.'s Laguna Salada project is advancing quite rapidly. "We are focusing on low-grade uranium that is near the surface in soft 'free digging' gravel," said Hugo Bastías, vice president for Argentina, U308 Corp. "These targets are cheap to explore and a resource estimate can be done fairly quickly. In addition, they offer potential for low-cost mining and processing. Laguna Salada is similar to other superficial-type uranium deposits that are in production in Australia and Namibia. Our goal is to complete a NI 43-101 resource estimate on Laguna Salada by the end of 2010."

The company's CEO, Richard Spencer, said the boost in uranium demand will not only come from more traditional nuclear reactors. "Mini reactors are going to be an interesting development," Spencer said. "In countries like Argentina and the U.S. where the distances between cities are vast, mini-reactors have an enormous application because you do not need long and costly transmission lines." Spencer also said the widespread use of electric cars and the resulting increase of electricity demand will be another key factor. Electric cars are the main growth driver of another strategic mineral experiencing a boom in Argentina: lithium.



Omar Adra, chief executive and financial officer, UrAmerica.



TSXV: LI

Helping Make Argentina the Leader in Lithium

## Sal de Vida Lithium Brine Project

## Salar del Hombre Muerto, Argentina

## Taking the Risk out of Lithium Development

- Quality Chemistry, Proven Jurisdiction
- Feasibility study in 2011
- Strategic Partnership with Korea Resources Corporation GS Caltex and LG International

Lithium One Inc.  
www.lithium1.com



## The Brine Fever

While the global crisis had a serious impact in global lithium production (estimated at 100,000 mt of lithium carbonate equivalent last year), the prospects for the future seem very bright for this commodity. Global production is currently controlled by a few players, but demand projections are opening the door to new companies. The Atacama Desert in Chile; Uyuni in Bolivia; and the puna in Argentina (highlands in the Salta, Catamarca and Jujuy provinces) are estimated to host about 80% of the world's lithium reserves.

Argentina is the second largest producer of lithium after Chile, with just one company extracting it: Minera del Altiplano at the Salar del Hombre Muerto. The site belongs to FMC Lithium and it is the only upstream operation of the group. In production since 1997, its output of lithium chloride and lithium carbonate is the result of a unique technology (protected by patent) developed by the company's Argentine personnel.

Production in 2010 will reach 17,500 mt of lithium carbonate equivalent (close to 2008's 18,000 mt), a sign the industry is recovering after last year's crisis. The company is currently investing to push output to 23,000-24,000 mt by 2012 and start producing potash as well. According to Daniel Chávez, general manager, Minera del Altiplano, however, the expanded production capacity will be insufficient by 2015 and the company will have to think of new horizons.

"Some estimates foresee that by 2025 the market will demand about 300,000 mt of lithium carbonate equivalent," Chávez said. "However the known reserves already exceed any demand from the automotive industry, thus I do not believe the prices will change significantly. The interesting part is the volumes will steadily increase."

A company on its way to becoming Argentina's second producer of lithium is Rincon Lithium, owned by the Sentient Group and which operates in the country via its subsidiary, Ady Resources. The company built a pilot plant in 2007 and it is now completing the production facilities to start commercial shipments in early 2011.

Daniel Galli, managing director, Ady Resources, described the project's advantages. "The Salar del Rincón is unique because there is a transmission line just 4 km from us and the gas pipeline and the railway are only 25 km away," Galli said. "Access is easy and we are close to Antofagasta, so getting to the ports is not bad. Besides, we are considering producing our own reagent on-



The Leading Argentine Uranium  
exploration company



## Discovering uranium in the most prospective basin in Latin America.

High grade uranium basin  
Fast track from exploration to production  
Low cost production

[www.uramerica.co.uk](http://www.uramerica.co.uk)

AV Figueroa Alcorta 3800, PB / Tel: (5411) 4804-2115 / Capital Federal, Argentina



site. The puna is so rich that there is lime, salt and other components.”

Galli emphasizes in the Argentinean puna there are 400,000 hectares of salars (salt flats) with lithium potential, but it is important to gain a strong position in the market as the demand will not be unlimited. “We are going to be the first project to be put into production after FMC’s,” Galli said. “Therefore we will try to occupy the market as it grows. Current producers will also expand their capacity so I do not think there will be room for many more producers.”

In this scenario, the secret for success will be competitiveness, and due to its favorable conditions, Argentina is already becoming a top destination for investors. “Chinese consume lithium from Australia which is extracted from spodumene. In theory, these producers will not be competitive against brine-based lithium. This is why the main focus of the industry is now in South America,” said Chávez.

### Asia’s Bet on Argentina

Perhaps the best indication of the expected growth in lithium demand is the level of lithium buyers looking to integrate vertically. Lithium Americas, a company active in the Salar de Cauchari in Jujuy, has Mitsubishi (4% stake) and Magna (the world’s largest auto-parts company, 14% stake) as shareholders. Toyota Tsusho is supporting Orocobre’s feasibility study at Salar de Olaroz and has the option to buy 25% of the project. A Korean consortium led by KORES has agreed to fund Lithium One’s Sal de Vida project through feasibility, and is expected to hold 30% of the asset once it is in production.

“In this business you don’t have a mine if you don’t have a customer,” said Patrick



Patrick Highsmith, president and CEO, Lithium One.

*Focused on developing  
one of the world's largest  
lithium brine resources*

Jujuy - Argentina

**LITHIUM AMERICAS CORP.**  
LITHIUM AMERICAS CORP.  
(TSX:LAC)

[www.lithiumamericas.com](http://www.lithiumamericas.com)

**ENERGIA  
MINERAL**

A Calypso Uranium Company  
[www.calypsouranium.com](http://www.calypsouranium.com)

**CLEAN ENERGY  
FOR A SUSTAINABLE FUTURE**

Highsmith, president and CEO of Lithium One, who highlights the importance of the partnership. "We have a relationship with a government that has named lithium as a strategic commodity and a country that produces 38% of the world's rechargeable batteries and also has the fastest growing automotive company in the world (Hyundai)."

KORES will provide \$15 million until Q4 2011, and the consortium will secure a debt facility for mine construction (the project should cost in the region of \$140-\$200 million). "While this will take considerable burden off our shareholders, more importantly these are the buyers for the lithium. They will acquire 30% of the production at market prices and they have a right of first offer for a further 20%," said Highsmith.

The Sal de Vida project is actually located next to FMC's producing facilities, in the other half of Salar del Hombre Muerto. "FMC is known to have great chemistry. One of the key bad players in lithium brine is magnesium and this brine has the lowest magnesium to lithium ratio in South America and one of the lowest in the world. Through drilling we have seen the chemistry is consistent in our part of the salar," said Iain Scarr, vice president of development, Lithium One.

Lithium Americas, a lithium-focused spinoff of Latin American Minerals, already has an inferred resource of 4.9 million mt of lithium carbonate at the company's Cauchari salar. The company, which has recently raised \$45 million from its IPO in Toronto, is building an evaporation pilot plant and expects to have full feasibility completed by the end of 2011.

With regard to the agreement with Mitsubishi and Magna, these partners will finance mine construction with interest-free loans and interest-carrying loans. Then Magna has priority to buy up to 25% of the lithium production and Mitsubishi up to 12.5%, at 5% market discount.

Waldo Pérez, president and CEO, Lithium Americas, explained how different lithium production is when compared to metallic mining. "If you have a copper or gold mine, the process is the same regardless of your location. In lithium what we mine is brine, hyper-saline water, which we put in evaporation ponds," Pérez said. "It is nature that gives us the necessary energy for the process: sun and wind, which we have in abundance in Cauchari. Even though lithium is the best way known to store energy, 90% of the batteries are made of nickel-cadmium or nickel metal-hydride. This gives

us an idea of how much the demand for lithium could increase by."

Australia-based Orocobre is working with Toyota Tsusho which is contributing \$4.5 million to a feasibility study. Sources at the company expect to finish feasibility by Q1 2011 to have the Olaroz salar, which offers a competitive magnesium to lithium ratio of 2.8, in commercial production by Q3 2012. Lithium production at Olaroz will be accompanied by potash as a by-product.



"The market is highly competitive and there is lots of speculation regarding the moves of the main players and the arrival of new companies, said José de Castro, Orocobre's general manager in Argentina. Growth will be driven by the adoption of hybrid and electric cars and the policies to promote its usage, as is happening in China. My personal view is that hybrid cars will be the dominating trend initially."

Castro said a full-electric car requires about 20 kg of lithium, 10 times more than a hybrid car, hence the importance of a potential transition toward full-electric cars.

Highsmith believes this transition could take place soon. "Toyota is projecting production of 2.5-3 million lithium-powered hybrid cars by 2015, and between 2015 and 2020 they expect hybrids to phase out and the full electric to come on. A general point of view is that at least 10% of the cars sold in 2020 will be either hybrid or electric. This is 6 to 8 million vehicles."


No wonder that lithium fever has struck Argentina, which also hosts a handful of other exploration companies including Rodinia Lithium, Li3 Energy and International Lithium Corp. If projections are correct, the country will certainly become an indispensable source of lithium.

*We've been fostering development for thirteen years. And we expect to continue doing so.*





Argentina    Community    Environment    Future

Minera Alumbrera opened up a new mining industry. It employs 11,000 Argentines both directly and indirectly, and rolls out economic benefits across Argentina, based on sustainable community and environmental management practices.



Led by




Waldo Pérez, president and CEO, Lithium Americas.

# Improving the Provider Base

*For a country with a mining sector in its early stages, finding local service providers cannot always be taken for granted. Yet the situation has greatly improved over the last few years, due to the arrival of new players and a new mining orientation among Argentine companies that previously served other industries, mainly the oil and gas sector.*

One way of measuring the mining sector's multiplying effect over the economy of an area is counting the number of providers that it needs. In San Juan alone just two gold mines, namely Veladero and Gualcamayo have had a tremendous impact, said the Governor of the province, José Luis Gioja. "There are about 900 small and medium enterprises that have been created around the mining sector and perhaps we will need more. Some of these companies are already working outside San Juan and we also have local companies making joint ventures with foreign providers to become more competitive."

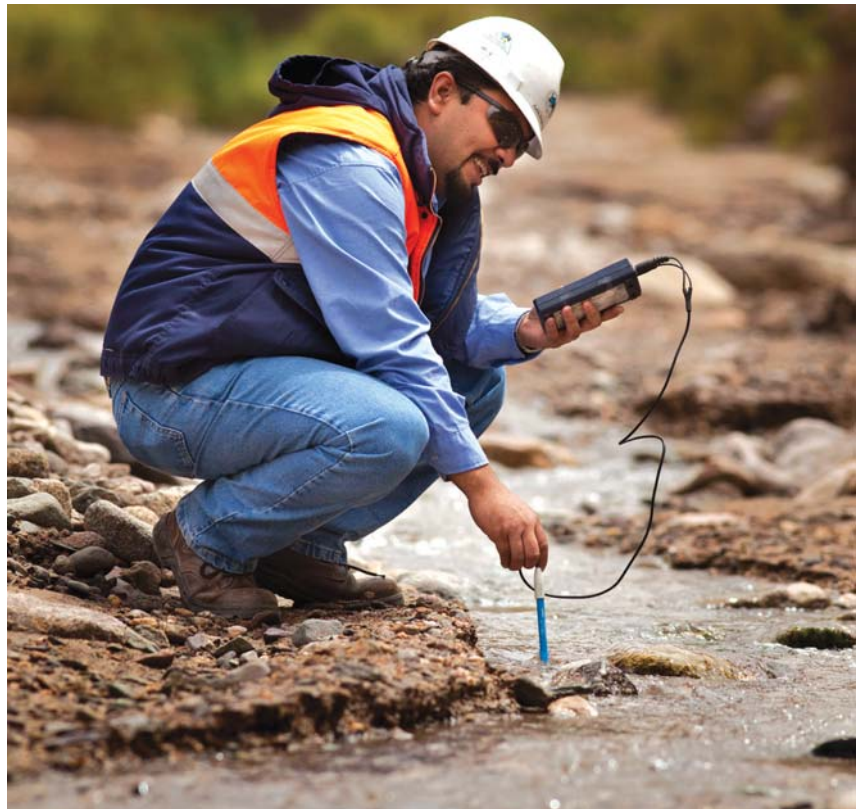
At the national level, providers are grouped in two main associations: CASEMI and CEPASM.

While the requirements change during the life of a project, companies offering engineering and environmental services are always needed. Ausenco Vector (previously Vector Engineering) has been in Argentina for 14 years, and has several offices to serve the different mining jurisdictions, with a total of 50 employees in the country. Half of the company's business in the mining sector is related to environmental work, which should remain a strong part of the company's business.

Silverio Protta, general manager of Ausenco Vector in Argentina, said the integration of Vector within the Ausenco Group since 2008 (together with PSI and Sandwell) is creating interesting synergies, as the other group companies had limited experience in Argentina. "The next level in this process would be sustainable design, that is, to incorporate the environmental aspects since the very beginning of the design phase," he said.

The growth of Argentina's mining sector, both in exploration and production, has prompted SRK Consulting, another multinational, to open a permanent office in Buenos Aires via the acquisition of an Argentinean consultancy, which had worked with SRK Chile since 2002.

With 14 professionals, the firm is involved in a number of geotechnical and



Environmental monitoring is essential to ensure the sustainability of mining operations. (Photo courtesy of Minera Alumbreira)

civil engineering works but is already targeting the mining sector aggressively (which already accounts for a third of their revenue), with the aim of forging a strong environmental team in-house and doubling the number of professionals by 2012.

SRK Argentina's General Manager Alejo Sfriso explained on the importance of good environmental work in the design of mining operations. "Argentines hold some universal truths, two of which being that the Argentinean beef is the best in the world and that mining pollutes. People should look at Chile and see that after more than a century of mining, you do not see all of the pollution campaigners claim the industry produces. The positive aspect of working in such a challenging environment is that mining companies are forced to implement the highest standards possible."

As well as large engineering companies with environmental divisions, there are also pure environmental consultancies, such as multinational company ERM (with offices in Buenos Aires) and Argentinean firm Estudios y Servicios Ambientales (EYSA), known in the market as Ambiental.

"Some people in Argentina speak of mining and environmental protection as if they were opposed terms. This does not happen to other industries," said Fernando Valdovino, general manager of Ambiental. Yet, he points out Argentina has an advantageous position. "You do not have to deal with site remediation of past operations or modification of facilities and technology to meet present industry standards."

The downside of being a new industry is that for some specialized areas, such as mineral processing, it is very hard to find

experienced professionals. "Argentina is host to mega-projects for the first time experts in mineral processing, for instance. "Argentina is host to mega-projects for the first time, therefore it is good to hear from foreign experts. Yet Argentina needs to ensure its professionals have adequate training, said Marcelo Martínez, general manager of engineering company Golder Associates in Argentina. We find it difficult to hire skilled local people with the different engineering and geotechnical backgrounds applied to mining. Luckily the country has good environmental expertise."

Some companies active in other engineering fields such as oil and gas, power and infrastructure, are increasingly looking for jobs in the mining sector. These include MWH, who expects mining will account for 50% of its revenue in the medium term, and Taging, an Argentinean firm that has set up a distinct mining division and counts Cerro Vanguardia as its main mining client.

"Many companies in Argentina lack the specific knowledge of the mining sector, said Lucinda Wood, head of the Mining Department of Taging. In oil and gas you can follow the same model all the time, but in mining gold processing is not the same as copper processing, for instance."

Besides, there are other challenges for providers trying to get their first projects in the industry. "Designing a tailings dam can be simpler than designing a dam for a power project, yet the mining clients like to interact with engineers that speak their own language, that means people who are familiar with mining. This human factor can be a challenge," said Sebastián Risso Patrón, country manager of MWH.

## Growing Opportunities

The new wave of exploration activities is pushing the demand for services such as drilling and geochemical analysis. One of the main players in laboratory services for exploration is Alex Stewart, a company with more than 100 employees, most of which are in Mendoza. Mauricio Olmedo, Alex Stewart's general manager, said his company is the only one offering the whole geochemical process in Argentina. "As the mining industry grows, we will need to set up laboratories in the north and in Patagonia, close to the mining operations. Moreover, we will target other services required by the mining sector, such as inspections, which will be a big area of focus for us in the future as a new business unit," Olmedo said.



Hugo Saidón, manager, Segufer.

As the industry grows, mining companies are increasingly focusing on their core business, mineral production, while there is a trend to increasingly externalize other related services, which opens business opportunities for providers. Yet, it is a slow process. "We operate laboratories right at the mining operation, acting as an outsourcing partner. However mines in Argentina are very new and mine operators tend to be conservative: sometimes they see outsourcing as a loss of control over their own operation," said Héctor Oporto, manager at SGS.

A company that has had tremendous success as an outsourcing partner is Segufer. The company, a supplier of safety equipment, hardware and electrical components among others, has experience in managing the storage facilities of mines at Alumbreira and Veladero, both during the construction and the operation.

Hugo Saidón, manager at Segufer, said being present at the mine sites since the construction phase has opened up new business opportunities for the company. "As a supplier we became more experienced. In aspects like fluids and electrical components, sometimes we had to deal with issues that had never come up in Argentina because the industry is very new. This is how we developed our engineering solutions department."

Segufer also represents companies like 3M and due to its privileged relationship with several mines it does not lack offers to incorporate new brands into its portfolio, although Saidón states they remain very selective with the products they distribute.

## Long-Standing Clients

What is clear is that mining clients require a significant amount of help from providers

**SRK Consulting**  
Engineers and Scientists

**SPECIALIZED CONSULTANCY SERVICES IN:**  
Geology • Mining Industry • Hidrogeology • Environment  
Geotechnical, Structural and Seismic Engineering.

Rivadavia 926, of. 901 (C1002AAU), Ciudad de Buenos Aires, Argentina  
(+54-11) 5291-5118/5119 (+54-11) 4342-3160/5447  
info@srk.com.ar www.srk.com.ar

before and during the exploitation of a mine. They are therefore juicy accounts for providers, but getting the first contracts is a challenge. Hence the strategy of some contractors to work for mining companies from the exploration phase. A good example of this is Eco Minera, a construction company based in San Juan specialized in road works (it currently has a three-year contract with Veladero for road maintenance). The firm has managed to increase its customer base with its drilling business, with 14 operational rigs.

As in engineering, the Argentinean oil and gas business accounts for a significant proportion of many providers' experience in operation and maintenance contracts. With hydrocarbons production in decline, mining appears as the best bet to forge long-standing relationships with clients. "The mining projects are very long-term investments. As long as the mining operations have reserves, it is highly likely they will be into operation because a large portion of their costs is fixed costs," said Gustavo Burgwardt, president of Burgwardt Minera, a mining-oriented spinoff of construction company Burgwardt.

"We do not want to build a project and leave, which is the way it works in road construction for the public sector. We want



Guillermo Rodríguez, general manager mining and construction, Atlas Copco.

to stay there like we have done for the oil industry. Mining projects are very big but there are just a handful of them, so the pressure to get at least one of the jobs is big," said Burgwardt. He believes his company's experience developing a quarry will play a role in winning projects as mining contractors. "We have expertise doing drilling services, transportation, blasting and crushing. We could perfectly become partners in mining exploitation. The trend in Chile is toward more outsourcing in this

area. Besides, we are obvious partners in road construction and maintenance."

Skanska is another player with a long trajectory working for the oil and gas sector in Argentina, in both engineering and construction and operations and maintenance. The mining sector, however, is not new for the Swedish-based multinational, as they have participated in projects like Alumbreira and Cerro Vanguardia in engineering and construction. "In mining, we are not specialized in the engineering of the process plant as some other contractors, but we can do any complementary engineering related to the project. This is a market that works a lot through EPCM, therefore we are always there positioned as a construction partner," said Martín Cittadini, country manager of Skanska.

### Technologies for Efficiency

Large suppliers of equipment such as Finning (Caterpillar distributor) and Atlas Copco play a key role in improving productivity in the exploitation of the mines. The broadness of their product portfolio, however, means they have to dedicate huge efforts to customer support. In Argentina, a vast country with difficult logistics and a shortage of specialists in certain fields, this

**BURGWARDT**  
MINERA

Bringing 100 years of constructing expertise to the service of the mining industry

- Roads construction and maintenance
- Excavation, cargo, transportation and soil levelling
- Construction of perforation platforms
- Transportation of minerals and liquids

**BURGWARDT MINERA S.A.**  
Avda. Leandro N. Alem 690 - 8º Piso, C1001AAO Ciudad Autónoma de Buenos Aires  
Tel: 54 11 4313-8374 Web: [www.burgwardt.com.ar](http://www.burgwardt.com.ar) Mail: [minera@burgwardt.com.ar](mailto:minera@burgwardt.com.ar)

**Mining Projects**

- Vale Bayovar
- Cerro Corona
- Minera Yanacocha
- Shougang Hierros Perú
- Cerro Verde Southern Perú Cooper
- Collahuasi
- Soquimich
- Minera Aguilar
- Minera Pirquitas
- Proyecto Gaby
- Compañía Minera del Pacífico
- Minera El Tesoro
- Codefco Norte
- Minera Las Cenizas
- Gualcamayo
- Minera Los Pelambres
- Codefco Andina
- Anglo American Minera Sur Andes
- Codefco Teniente
- Minera Santa Cruz
- Manantial Espejo

**Tecnet**

*Over 20 years providing solutions for Mining processes.*

- Engineering
- Automation
- Consulting
- Commissioning
- Instrumentation
- Implementation
- Communications
- Start up

- Argentina
- Chile
- Perú
- Uruguay
- Colombia
- México
- Brasil

GRUPO IBERMÁTICA

[www.tecnet-ibermatica.com](http://www.tecnet-ibermatica.com)

can be a challenge. “Only in the mining and construction division we have 200,000 products,” said Guillermo Rodríguez, general manager of mining and construction, Atlas Copco. “To visit a remote mining operation, you need at least two days. Moreover workers need to adapt to the altitude. If you consider this and the fact that we have seven business lines, it is quite difficult to find all the qualified people we need.”

One of the company’s strengths is underground mining, as nearly half of Atlas Copco’s equipment active in Argentina is below the surface. Underground mining is a business Finning is also targeting aggressively. “Caterpillar is a relatively new player in underground mining, but we have some phenomenal equipment in this area and are growing very quickly. Underground is the future of mining. Companies using Caterpillar in both surface and underground operations will benefit from the synergies created,” said Andrés Duggan, commercial manager for mining at Finning.

Smooth system integration and automation is key in the highly complex environment of a mining operation. French-based multinational Schneider Electric, a company with a strong presence in Argentina, positions itself as a specialist in energy management. In the industrial field, the focus is on the transformation process of raw materials. “At the end of the process you have the final product and waste. Managing the energy one can optimize the amount and quality of the final product per unit of energy used, but also you can reduce the amount of waste. Optimizing energy usage saves costs and improves the quality while also reducing the environ-

**MINERA mariana argentina s.a.**

**Adding Value by Discovery in South America**

Focused on the identification, exploration and discovery of gold, silver and copper deposits in Argentina and South America

**Minera Mariana Argentina S.A.**  
 España 776 - 3er Piso - Dpto. 1 (CP 5500) Ciudad - Mendoza - Argentina  
[cribo@mineramariana.com.ar](mailto:cribo@mineramariana.com.ar) / [www.marianaresources.com](http://www.marianaresources.com)



Martín Cittadini, country manager, Skanska.



Andrés Duggan, commercial manager for mining, Finning.

mental footprint of the industry,” said Diego Areces, cluster director of mining, minerals and metals of Schneider Electric. The company expects to grow its sales in the mining industry in Argentina by more than 20% annually in 2010 and 2011.

Tecnet, a large system integrator, only entered the mining sector seven years ago,

but the industry already accounts for over 40% of its sales. The company has alliances with a number of technological companies in order to provide holistic solutions to the clients under turnkey projects schemes. “Our core business is the design and integration of systems. Mining projects are always big projects in terms of revenue and they are explosive in the timings. The deadlines are always tight,” said Carlos Koiffman, general manager for Latin America, Tecnet.

The company has completed projects in Chile, Argentina and Peru and is now looking to expand into Colombia and Mexico. Vale’s Bayóvar in Peru and Silver Standard’s Pirquitas in Argentina are two of the company’s most recent projects. Koiffman’s aim is to consolidate Tecnet as Latin America’s largest system integrator. “With vendors, the clients need to adapt to what the provider can offer. We take the best products from each vendor and prepare a tailored solution. We believe we have an edge in this respect.”

The development of mining in Argentina has created very interesting business opportunities for providers in the country. Many leaders believe the sector has only shown a tiny bit of its potential so



Carlos Koiffman, general manager Latin America, Tecnet.

far. Indeed, there are valid questions about how fast the industry can grow. Yet service companies are already taking positions to cover the market as it develops. As Chilean providers have done over the years, Argentinean companies have a golden opportunity to grow together with their country’s mining sector.



**INTEGRAL SUPPLIER FOR THE  
MINING INDUSTRY IN ARGENTINA**



MRO and Safety Products

Experts in vendor held stock management.

Pumping, fitting, piping, energy, filtering for extraction  
and processes solutions.


Permanent and personalized attention in all the key  
mining points of the country.

**SEGUFER**  
Toll 2875 (esq. Vélez Sarsfield al 900)  
CP 1280 Ciudad de Buenos Aires-Argentina  
TEL: (54 11) 5552 5555 WEB: www.segufer.com.ar

**BRONS & SALAS**  
ABOGADOS - ATTORNEYS AT LAW

AGENTES DE LA PROPIEDAD INDUSTRIAL  
INTELLECTUAL PROPERTY AGENTS

**Vast experience in mining law**



**Brons & Salas**  
Maipú 1210, 5th floor, C1006ACT  
Ciudad de Buenos Aires, República Argentina  
Phone: +54 11 4891 2700 Fax: +54 11 4314 0399

**Contact persons:**  
Hernán M. Zaballa – Direct line: +54 11 4891 2751  
Sebastián P. Vedoya – Direct line: +54 11 4891 2753  
Sergio D. Arbeleche – Direct line: +54 11 4891 2855