

# Mining in Argentina

*Hiding in plain sight*

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Cover photo: Process plant in Casposo. Courtesy of Troy Resources.

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# Argentina: an Overview

**After centuries of inactivity, the last decade has seen a renaissance in Argentina's mining industry.**

Argentina is a country for mining entrepreneurs with an appetite for risk and eager for incredible geology. Despite the very name of Argentina being a reference to its mineral resources (in Latin, Argentina is the feminine noun for silver), the second biggest South American country has yet to develop its mineral potential.

After remarkable growth in the mining sector over the last 10 years, the nation

should now see the beginning of a new era with very large projects coming into place for the first time. According to the Secretary of Mining, there are a total of 614 mining projects, including the large scale Barrick Gold's Pascua Lama and Vale's Rio Colorado.

These projects range from exploration to production and from industrial minerals to precious metals and are changing the face

of Argentina. According to Julio Ríos Gómez, the president of the association of exploration companies in Argentina, GEMERA: "In 2003, commodity prices started increasing again and mining companies realized that it was a good moment to invest in exploring new deposits. About 70% of the exploration activities involves small and medium companies, and subsequently the industry started developing at a very quick rate."

## Interview with Jorge Mayoral, Secretary of Mining of Argentina.

**Could you describe the main changes in the mining sector in Argentina since last we spoke three years ago?**

Increasingly, South America is becoming a world class mining destination. In Argentina we are observing a series of positive impacts that are being generated by the sector, which can be seen in the creation of jobs and improving the quality of life of those in their zone of impact. In Argentina we understand that mining is a mother industry, in the sense that it provides the invaluable materials required by every other industry. Since 2010 we have observed the creation of ever larger projects, which is the direct result of a long-term vision of the government.

**What are some of the results of this evolution?**

Amongst other projects, we believe that Lama Pascua (sic) is a very paradigmatic example, because it is being conducted on both sides of the Argentina-Chilean border with Canadian investment of around \$8 billion. Today, investors understand that Argentina had the geological potential and a government that wants to help develop such potential. Another project is Rio Colorado using Brazilian, Chinese and Indian capital. It is very symbolic because of its superlative dimensions and because of the importance it has to the province of Mendoza, where it is located. It is representative of the cooperation between Brazil and Argentina, two of the most important countries of the region. We believe that these two projects symbolize a new era in the development of South America, going beyond semantic cooperation and integrating the economies with positive results for the world and especially for the countries in the region. We are also observing the realization of this long-term vision in other areas as well, such as the development of Argentina's large lithium reserves.



**What recent initiatives have been taken to promote investments?**

We established the Organization of Mining Provinces (OFEMI) bringing together the 10 provinces of Argentina with the most geological potential. This initiative has been created to boost the mining business environment in the country by engaging in talks with investors and with the civil societies, explaining the benefits and the challenges that mining can bring. OFEMI is a way to promote dialogue and to help build consensus. In our country we have federal rules and provinces have the liberty to apply them according to their realities and needs. In

Argentina, the provinces are the ones who own the mineral resources and they apply a federal legal framework according to their respective needs.

One of the widely misunderstood initiatives of the government has to do with how profits are sent abroad. In these times of international crisis, we created rules to safeguard our economy while not interfering with how businesses are run. The measure our government has taken only requires companies to coordinate the time between when they make their shipments with when they send their profits to their headquarters.

**What should we expect next for mining in Argentina?**

It is a good moment for mining in the country. Argentina is widely known for its reserves of precious metals but we also have many others such as copper and industrial minerals such as lime and lithium.

We believe that Argentina will become one of the next big players in copper. We want to let the international mining sector know that everything that is happening in Argentina right now is just the tip of the iceberg of a virtuous cycle for mining in the country.

It is surprising that Argentina is so underexplored when compared to neighboring countries Chile and Brazil. Theories explaining this vary widely. One of the most accepted explanations is that, because Argentina has such fertile land, most investments have been focused on agriculture, generally considered to be less risky than mining. "So far, Argentina has been known for its agriculture, but if mining develops to its full potential, we should see incredible changes. We are seeing ever-larger projects such as Rio Colorado and Pascua Lama, but we expect to see much more. Projects mining for copper such as El Pachón and Agua Rica are both going to invest nearly \$5 billion. These and other projects will help change the Argentinean business landscape dramatically by bringing not only investments but development to the regions where they are located," said Leonardo Viglione, a partner at PWC Argentina.

There are several provinces that do not have the potential for agriculture but have geological potential that many believe, if put together, could be the equivalent of the sum of Chile and Peru. María Inés Llorvandi, the general manager of the Argentinean subsidiary of the Chilean engineering firm JRI is optimistic when it comes to Argentina's geology. "The mining industry in Chile is very well developed and looking at the broader size of Argentina and the geology here, it is logical to expect that in the near future the benefits could be significantly higher than the ones that Chile has received," she said.

With gold prices reaching more than \$1,700/oz, a favorable context has been set for explorers and Argentina saw an increase of 664% in drilling activities for different minerals by exploration companies since 2002. Nevertheless, despite great expectations when it comes to the geology of the country, private companies look at Argentina's political scenario with caution that leads to pragmatism. Walter Soechting, general manager of Gold Fields in Argentina said that his company drilled 8,000 meters in 2011 but only 5,000 meters in 2012, a strategy that seeks to balance the risks associated with investing in the country and its geological potential. However it should also be noted that their activities in Las Taguas, their flagship project in the country, is also close to its final stages of exploration and should enter the development stage soon where less drilling is required.

Ignacio Celorrio, the president of the Argentine Chamber of Uranium Companies (CADEU) and a partner of the law firm Quevedo Abogados, reckons that current regulations may also continue to stifle investments. "Some provinces are trying to force mining companies to associate with provincially controlled companies. I don't particularly consider this a negative thing in all situations, but impositions tend to be inconvenient as a general rule to most projects. It is not clear what impact these initiatives will have on the industry. Clearly it is not a specific Argentinean issue; many countries are reviewing their mineral policy with a more interventionist view," he said.

Damián Altgelt, general manager of the Argentine Chamber of Mining Companies (CAEM) is part of the front that is working to set a better context for mining companies and its investors. This has proved to be a constant effort to create a more stable and homogeneous business environment and awareness so that, if efficiently regulated, the mining sector can have even greater positive effects. "Our regulatory framework has not provided all communities with the sense of stability and security they expect. Currently, there are seven or eight provinces which have anti-mining legislations. Some of these include provinces which do not have a lot of mining opportunities but the rest have adopted such legislation due to political reasons because ultimately it won them votes" Altgelt said.

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# Regulations

## Unraveling the federal/provincial knot.



Articulated haul trucks move rock at Troy Resources's Casposo mine. Photo courtesy of Troy Resources.

Argentina's regulations are a complex arrangement of laws that reflect the country's federalist nature, where provinces hold much independence on how to apply umbrella regulations created by Argentina's central government. As a result the regulatory framework of the country is diverse, especially when it comes to the yet to be developed mining business.

In a country with no shortage of political cleavages, one could get confused with so much going on and miss the larger picture. At this moment, a new balance between provinces, the federal government and mining companies is being sought and two main initiatives should be watched closely. The first is the creation of provincially controlled mining companies and the second is the establishment of the Organization of Mining Provinces (OFEMI). These could reshape regulations of the mining business and bring long-term stability to issues like taxes, land property and hiring local labor in the country.

In an attempt to make the business environment for mining more homogeneous, the OFEMI has been established as a forum for the 10 major mining provinces of Argentina. It seems that the overall perception of this new organization is positive. "With OFEMI the mining industry in Argentina will have a new forum to discuss topics relevant to the mining industry. This brings more transparency and can potentially educate Argentines about the real facts of mining," said Ignacio Randle, a partner of the law firm Estudio Randle.

With so much growth and opportunities, the focus now is to create a mining culture. Roberto Cacciola, general man-

ager of Minera Santa Cruz, a joint venture between Hochschild Mining and McEwen Mining, said: "Argentines still do not understand mining. This is partly the fault of the industry, although nowadays we work to communicate why mining is important to everyone's lives. Communities close to mines know more about mining and tend to be more in favor, while in cities like Buenos Aires communication is an effort that still is incomplete."

Mining leaders understand that a change in the Argentinean public opinion is required.

"There's popular ignorance about mining, and politicians harness this fact as an opportunity to discredit this industry and get more votes. Because people do not know how much we care for the environment and of the benefits mining generates for society, some projects can be at risk of not going ahead," said Alejandro Donna, president of CASEMI, an association of service providers.



Hugo Dragonetti, president, Panedile.

CAEM's Altgelt said: "Changes in legislation and regulations are frequent, as indeed are changes of government. In cases of new legislation, we try to serve as an alarm to the local governments by pointing out the negative effects that policy changes could have on investments in the mining sector. We try to let local governments know what are the needs of the industry, what are the costs and where are the opportunities for the companies. Our goal in this aspect is to be a mediator between the companies and the provinces and to create a win-win situation for everyone."

### Provincially Controlled Mining Companies

Provincially controlled mining companies are emerging as important new actors in Argentina.

These are companies that are created by the provinces to go into joint ventures with private companies looking to establish operations in a particular province. Companies such as YMAD, from Catamarca, and FomiCruz, from Santa Cruz, are examples of these and there have been contrasting views of these companies.

In the mind of private investors, the fear of working with provincial mining companies is that business interests get mixed with political motivations. In this context, the ultimate fear a private investor in Argentina can have is that his company is subject to similar treatment to that of oil company YPF, that was recently nationalized by Cristina Kirchner. Despite the events of YPF having little to do with the mining sector, it represents a precedent that could be repeated. Indeed,

mixing the fear from the YPF case with the lack of knowledge about provincial mining companies, one can easily understand the investors' skepticism. Alfredo Vitaller, the general manager of NGEEx Resources, a precious metals exploration company, said: "The nationalization of YPF did have an impact on investment generally, and mining was also affected. When it happened, we received about 20 phone calls from investors asking if the move would have any incidence on our projects."

Michael Brown, president of Argentex Mining, another junior, said: "Spells of government activity anywhere in the world that put foreign investment in a sector at risk affect our market valuation and finance-raising abilities. There certainly is an element of devaluation in the share price of any company here based on its exposure to Argentina."

Ignacio Celorrio, the president of CADEU said: "Some provinces are trying to force associations with provincial companies, which I don't particularly consider a negative thing in all situations but it is inconvenient as a general imposition to all projects. It is not clear if these changes are made, what effect on the industry they might have."

Provincial mining companies want to be seen as reliable partners capable of sharing not only profits, but risks as well. Manuel César Benitez, president of YMAD said: "Our primary objective is to create wealth, not only for our partners and us, but also for the communities where we develop our mining projects. We have close relationships with different provinces and we try to help them and pass on our experience to them so that they can better manage and develop the mining industry there."

Hugo Dragonetti, president of engineering company Panedile, that is also a shareholder of MinSud, an exploration company, said: "We are optimistic about provincial mining companies. We think this will bring greater security to the private investor. We are looking forward to work with them, both as engineering contractors as well as partners with MinSud."

The creation of mining companies controlled by the provinces could solve a dilemma regarding how the royalties from the mining sector are distributed in Argentina. In April 1993, the federal government approved the law 24.196, which, among other aspects, granted a period of 30 years of tax stability to mining companies.

However beneficial this law proved to be to the development of the mining sector, it created a potential conflict that is now becoming worrisome. Different provinces are realizing that their geological potential is tremendous and if they do not participate more actively in the development of the sector now, they might miss out.

Considering the liberal federalist agreement that rules the country and the fact that the mineral resources belong to the provinces, the creation of these mining companies can be seen as another chapter in a tug-of-war for more participation in the profits of a soon to be multi-billion dollar industry. But should the privately owned mining companies be against this? It seems that this can be a welcome remedy to a much more debilitating problem: anti-mining legislations.

As Hernán Zaballa said: "Anti-mining provinces are becoming more pro-mining because the industry can provide provinces much-needed financial resources. Between 2001 and 2006, many provinces placed unconstitutional bans on open-pit mining and the use of cyanide, but now they are coming back. The country is becoming more knowledgeable and sophisticated; provinces realize they can benefit from their natural resources when and where it is appropriate."



The advertisement features a background of gold nuggets. At the top center is a stylized lion's head logo. Below the logo, the text "GOLD FIELDS ARGENTINA" is displayed in a serif font, with "GOLD" in a blue box and "FIELDS ARGENTINA" in gold. At the bottom, a dark blue box contains contact information in white text.

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# Projects

Changing the landscape.



Miners enter the portal at the San José silver-gold mine. Photo courtesy of Hochschild Mining.

Argentina is not only seeing a dramatic increase in the number of mining projects but also in the size of these projects. Two projects that are raising the bar in Argentina are Barrick's Pascua Lama gold mine in San Juan and Vale's Rio Colorado potash mine in Mendoza.

The positive effects of these projects can be seen in different ways that go from the creation of new and more sophisticated service providers to the projection of Argentina

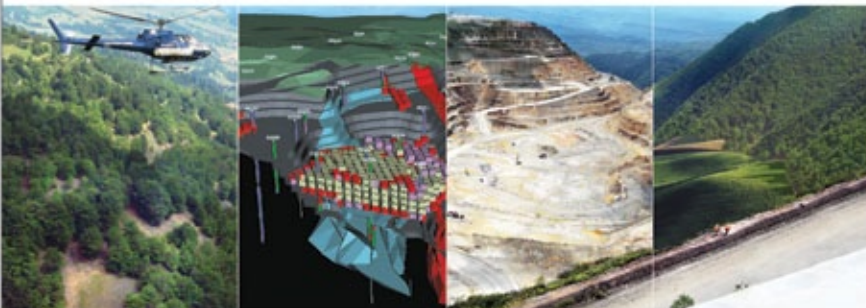
as a future world-class mining destination. Andrew Lloyd, Barrick's director of media relations declared that Barrick "expects to see Pascua-Lama entering production in late 2014, which will mark a significant increase in gold production for Barrick in Argentina. Pascua-Lama has 25 years or more mine life, and so we expect to be in Argentina for many years to come."

This project has a proven a probable reserve of 17.9 million oz of gold and 676

million oz of silver contained within the gold reserves, at grades of 1.44 grams per metric ton (g/mt) Au and 54.7 g/mt silver. The presence of Barrick in Argentina is not new as the company already owns the country's largest gold mine, Veladero. "Barrick first acquired an interest in the Veladero project on the Argentinean/Chilean border with the acquisition of Lac Minerals in 1994. Construction of the mine was completed in September 2005 at a cost of \$540 million. Today Veladero is one of the largest gold mines in the world, producing more than 1 million oz of gold in 2010 and 957,000 oz in 2011. Barrick has been operating in Argentina for more than 10 years, allowing us to build strong relationships with government and local businesses. We've had a local supplier development program in place for over a decade, with more than 900 Argentine companies supplying goods and services to Veladero and Pascua-Lama. The company has also initiated a program to substitute imports with locally available alternatives, with good results to date," Lloyd said.

Vale's largest project in Argentina, Rio Colorado, is going to connect the mine in Mendoza to the port of Bahia Blanca in the province of Buenos Aires through the construction of a railroad in Neuquén and Rio Negro that connects with an existing railroad in Rio Negro and La Pampa. Vale is expecting to invest \$5.9 billion in this project that also includes a processing plant in Bahia Blanca to refine the extracted potash. \$1.8 billion had already been spent by October 2012; however the project, planned to produce 2.4 million mt of potash per year, was suspended "indefinitely" last month as the Brazilian mining giant is trying to get a partner. Falling profits in the corporation are thought to be the reason behind the change of strategy.

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# Gold, Silver and Copper

## Argentina's polymetallic richness.

Since 1527 when a Spanish settlement was established, Argentina has been famed for gold and silver. Nevertheless, today only 25% of Argentina's territory has been geologically explored. Such a situation is bound to attract mining companies and risk-takers from everywhere, including Argentina itself.

Silver Standard sees Argentina as a strategic country. "Silver Standard was founded as an exploration company but since 2010 we have turned our direction also towards production. At the moment, Argentina is our most important location. We already have one producing mine (Pirquitas, 8.6 million oz Ag in 2012) as well as the Diablillos project that, once we finish our operational analysis, we will be in a position to develop further," said Favio Casarin, the institutional relations manager of Silver Standard.

There are currently 107 mining projects in Argentina in different stages of development that are related to gold or silver or both. Exploration companies are planting their flags fast as they look to discover the next Veladero. It seems that middle-sized projects can do well. This is the case of Minera Santa Cruz, a joint venture between Hochschild and McEwen Mining. "Minera Santa Cruz' operation, the San José Mine, is a medium sized project, with production between 10 and 11 million oz/y of silver equivalent, equally split between silver and gold. The mine life has been increasing every year; today we have resources for 13 years. In 2012 we are drilling 110,000 meters, and the idea is to continue exploration as the region has impressive potential. We really do not see the limit to this mine," said Cacciola.

Pan American Silver, the world's second largest primary silver producer, operates the Manantial Espejo mine in Argentina with annual production of 4.3-4.5 million oz of silver at cash costs of \$8.60-\$10.40/oz (2012 guidance). The Vancouver-based company also holds the rights of the enormous Navidad project, and for this reason Argentina is an essential part of the company's future. However, the project is currently on hold due to a ban on open-pit mining activity in the province of Chubut since 2003.

"In our minds, Navidad is the best undeveloped primary silver deposit in the world. It could be a \$700-800 million capital in-



Roberto Cacciola, general manager, Minera Santa Cruz.

vestment", said Steve Busby, COO at Pan American Silver. "Primary silver deposits are few and far between. Surprisingly, two thirds of the silver production from mining today comes from by-products from other mines like copper or gold mines. Only a third comes from primary silver deposits, and most of them are small deposits. It is

rare to find big deposits like Navidad. It is very exciting: just that one mine has the potential to double the size of the company," Busby said.

On the gold front, besides the aforementioned Barrick, producing companies include Cerro Vanguardia, Yamana Gold and Troy Resources. Cerro Vanguardia, 92.5%-owned by AngloGold Ashanti, operates a gold mine in the province of Santa Cruz, provincial company FomiCruz holds the remaining 7.5%.

Despite the initial skepticism by investors towards the participation of the provincial government, it seems that Jorge Palmés, the country manager of AngloGold Ashanti in Argentina, is positive. "We have a very good relationship with FomiCruz. We feel we are an important part of the local community and have a strong sustainability program. We offer opportunities for them to work in the mine, and we are also helping put together a development agency in order to provide other sources of income. We have

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Ken Nilsson, executive director of Troy Resources.

a silver/gold mine, producing 240,000 oz/y of gold and almost 5 million oz/y of silver. We have doubled the budget for exploration: for 2013 it will be \$18 million. Cerro Vanguardia will be the center of concentric circles of exploration, and we will be looking for resources in surrounding areas. We are also looking for associations with other companies and every option is always evaluated carefully," said Palmés.

Yamana, who derives 20% of its global gold production from Argentina, controls the Gualcamayo mine in San Juan. Forecast to produce 190,000 oz in 2013, Yamana is expecting this mine to last for at least another nine years, which could be expanded with further exploration.

Another important project for the country is Alumbrera, a joint venture between Xstrata (50%), Goldcorp (37.5%), Yamana (12.5%) and the provincial company YMAD (who receive 20% of the net profits). Located in the province of Catamarca, Alumbrera is a gold and copper mine that produced 116,700 mt copper in 2011, as well as 328,000 oz gold (in concentrates) and 28,000 oz gold (doré).

Troy Resources' Casposo mine, in the province of San Juan, is one of the latest additions to Argentina's production portfolio, with output of nearly 71,000 oz gold for the 2012 financial year (89,000 oz gold equivalent if counting the silver credits).

"Casposo is not an expensive mine. For one ounce of gold equivalent, our operating costs are between \$450 and \$460 today. Of course we are still paying back the initial capital, but we have good margins," said Ken Nilsson, executive director of Troy Resources, a company headquartered in Australia.

"There are a few labor issues; unions have become very militant across Argentina, partly due to high inflation and the overvalued currency, which also impacts our operating costs. San Juan is exceptional

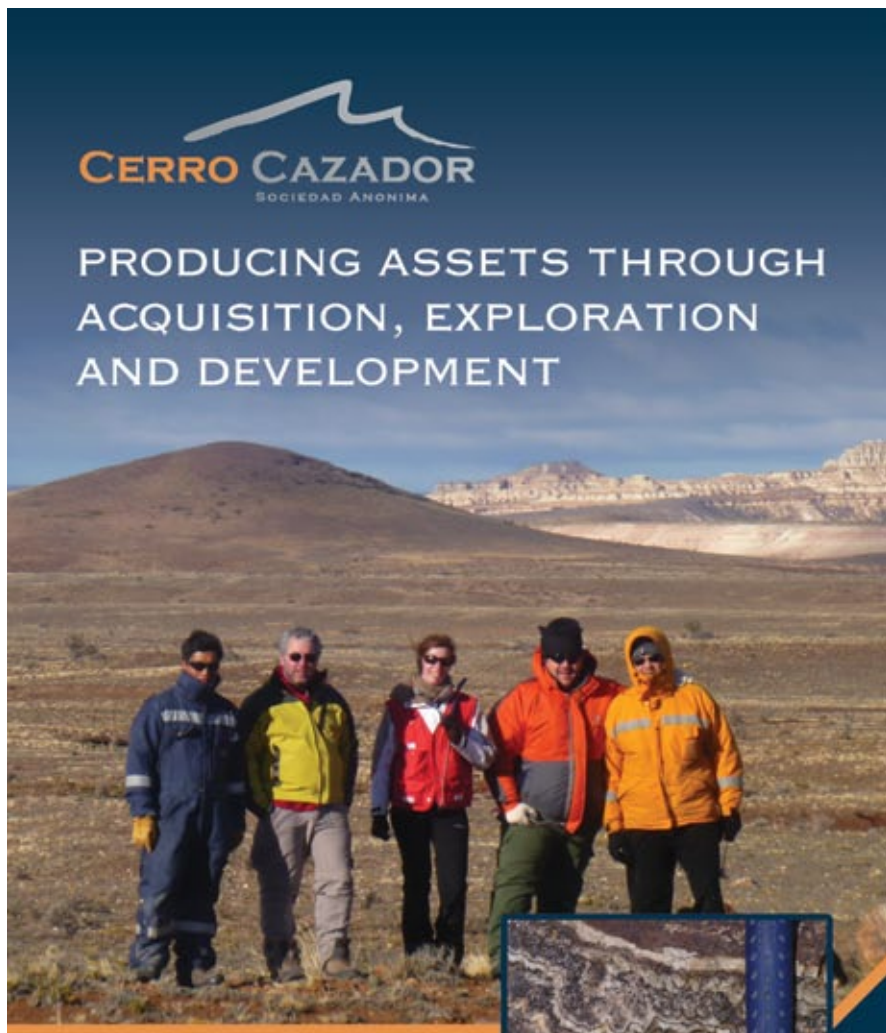


in having a government with the foresight to understand how the industry can work without being draconian. It is a pity there are not more governments like this – San Juan’s economic growth rate since the current governor came to power has been unbelievable,” Nilsson said.

A major gold project that will add soon to Argentina’s production portfolio is Goldcorp’s Cerro Negro, in Santa Cruz. A \$800-million investment, the mine is expected to yield an average 550,000 oz gold per year for the first five years, with production expected to start later this year. In this context, the fact that established gold producers arrive in Argentina looking for big deposits should not come as a surprise. Gold Fields of South Africa, for instance, are conducting exploration 25km north of Barrick’s Veladero. “We only have one joint venture, but are looking at other opportunities, with offices in San Juan and Mendoza. Santa Cruz and Salta are also showing exploration potential; we are in the process of building a strong pipeline of projects in the country”, said Walter Soechting, Gold Fields’ general manager in Argentina.

It seems that Gold Fields understands the challenges that a mining company can face in Argentina and is taking advantage of its global positioning in order to proceed with caution. “We want to become a producer of precious metals in Argentina because the geology is here and the overall conditions are improving over time. Gold Fields is in the country to stay, and we are looking a long way into the future – this is why we have to keep a low profile and make careful assessments. We do not want to be exposed to any politically driven situations, but we are not in a rush like a junior mining company. We have the financial backbone that will allow us to proceed carefully and to manage the risks we still have in Argentina,” Gold Fields’ Soechting said.

A junior company on its way to become a mid-tier gold producer is Lima-based Minera IRL, who is using the cash flow from the Corihuarmi gold mine in Peru to fund its expansion with two projects advancing towards production; Ollachea in Peru (the company’s flagship) and Don Nicolás in Argentina. Minera IRL’s executive chairman and CEO Courtney Chamberlain gave some details about the latter, located in the province of Santa Cruz: “Our Don Nicolás project is more advanced than Ollachea; we completed our feasibility study in February 2012 and obtained our development permit in Q4 2012, all of which was done in record time. At the moment, we are discussing the EPCM contract with engineering firms, and



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BACKGROUND PHOTO | Mining labor constructions in Foralón Negro Industrial Mining Complex

are working on the financing. It is a reasonably modest project, with roughly 50,000 oz/y and a fairly short mine-life in terms of the feasibility study. It is also very simple from a technical perspective, with an open pit and a leach circuit. Our 2012 drilling program has recently added 106,000 oz to the resource, and we are conducting metallurgical tests as to optimize recovery from the low-grade ore through heap leaching," said Chamberlain.

Also active in Santa Cruz is Hunt Mining. Benefiting from the stability that a partnership with FomiCruz has brought, Hunt Mining is actively working to build a strong pipeline of projects now, before Argentina gets under the radar of other international mining companies. "The Desado Massif in Santa Cruz has been the region where we have been most involved and we are encouraged by the results we are having. So far we have invested more than \$20 million in exploration in Argentina. Our main partner in Santa Cruz is the provincially-owned mining company, FomiCruz, which has a 9% participation in our flagship project, La Josefina. This is a gold and silver project and it has absorbed \$15 million of the total we have invested in the country," said Danilo Patricio Silva, president of Hunt Mining in Argentina.

Salta is another province that is attracting increasing investments; it is known for being a pro-mining province with great geology. Toronto-listed Mansfield is a precious metals explorer and developer that is eager to become a producer in Salta with its Lindero project. "Most companies interested in investing in Lindero are miners in production. Some are local, others are small foreign producers. It helps that Salta is now the country's most powerful mining province; it has a great deal of exploration and, being less crowded than San Juan, is more pro-mining," said Facundo Huidobro, the vice-president of Mansfield.

Despite this pro-mining reputation of the province, Mansfield is taking active steps to further educate the general public about mining activities. "Everyone in Salta's Puna knows about Mansfield and the work it is doing. It is necessary to educate people. Salta has a mining history, but the new generation does not remember it, and mining is different today from in the past," said Huidobro.

This lack of mining culture and limited industry history has both advantages and disadvantages. Alfredo Vitaller, the general manager of NGEx, a precious metals exploration company, explained: "In parts of Chile with clusters similar to what we

have in Argentina, the land will usually be split between 10 or so companies, but here the whole area of around 60 km by 20 km is held by us and our partner, with three areas of great potential and further evidence of mineralization elsewhere. In 2013, NGEx will spend around \$15 million in Argentina, which amounts to 30% of its overall budget. I believe Argentina has as much potential as Chile and Peru, but the main difference is that those countries began mining more than 100 years before us. It takes time to develop the infrastructure and culture; we need to explore and invest.”

Finally, Minsud Resources is emerging as an important player. With a strong pipeline of projects, Minsud is partially controlled by Panedile, an Argentinean-Italian engineering company that is known for its active role in large industrial projects such as hydroelectric power generation plants. “All the properties Minsud has in Patagonia are selected greenfield projects that belong 100% to Minsud. In a past joint venture agreement with another junior, we had regionally explored more than 400,000 hectares in Patagonia, and now Minsud controls about 60,000 hectares in three provinces: Rio Negro, Chubut and Santa Cruz,” said Carlos Massa, president of Minsud Resources.

The company’s main gold and silver asset, the Chita Valley property, was chosen for several strategic reasons. “The property is located 40 km from the towns of Bella Vista and Iglesia. People working at the site can stay overnight at home and get access to the property in a 4x4 vehicle in less than an hour via dirt road. Even though it is located in Central Andes of San Juan at 3,000 meters above sea level, it is good to work all season so we can employ a regular staff instead of hiring on a seasonal basis,” said Massa.

Panedile’s Dragonetti is also optimistic in regards to the overall changes in the mining context of Argentina. “Today 80% of the political leaders in Argentina recognize how much wealth the mining sector can bring to the country. We believe that mining is growing in an organic way in Argentina and we are still to find an ideal balance between companies, local populations and governments. What is happening at this moment is a positive contamination where anti-mining provinces are seeing the great results that mining provinces are having. San Juan has been one of the greatest showcases of this and now we are seeing Mendoza slowly moving towards a more reasonable position.”

# Strategic Minerals

## Emerging commodities put Argentina on the map.

Argentina’s potential goes beyond the traditional metallic mining: the country sits on the famous Lithium Triangle of salars; it has substantial potential in uranium, being a past producer of it; and, home to an enormous agricultural industry, the country can integrate vertically in fertilizers thanks to potash projects such as Vale’s Rio Colorado.

### Lithium

The bulk of Argentina’s lithium reserves are part of what is widely known as the “Lithium Triangle”, a region that extends from southwestern Bolivia, northern Chile and northwestern Argentina. According to the United States Geological Survey, Argentina supplied 50% of U.S. lithium imports in 2011 and, according to the International Lithium Alliance, Argentina contains 15% of the total global lithium reserves. However, one should expect to see Argentina’s lithium resources increase as further exploration takes place.

The country’s largest producer of lithium is FMC Lithium. “Since 2010 we have invested over \$50 million in Argentina with the goal of expanding our operations in Salar del Hombre Muerto and we are now completing the expansions of the lithium carbonate areas so that we can satisfy the need of our clients on a global level,” said Humberto Caldelas, general manager of FMC Lithium, which operates in Argentina under the name of Minera del Altiplano.

Back in 2010, FMC planned to be producing 24,000 mt/y of lithium by 2012 and by the end of 2012, FMC had achieved 80% of its ambitious target. The company plays the part of a good corporate citizen. “We work with universities in terms of scholarships and we also offer support for students in different schools in the province of Catamarca. Moreover, we have an internship program for selected students from different provinces and we keep on looking for more opportunities which would allow us to bring benefits to and strengthen our relationship with the communities in Argentina,” said Caldelas.

Argentina is no exception to the general trend of production integration, in which lithium producers are associated with battery manufacturers and users such as electric car manufacturers. Lithium Americas,

for example, currently holds agreements with Mitsubishi and Magna International. “The car industry is extremely sensitive to its supply of raw materials and this is especially true for innovative car manufacturers who are looking to build electrical vehicles. Most of the car producers need to rely on different suppliers as there are always factors such as political instability or force majeure which need to be taken into account and at the same time there are only three lithium producers in the world. This is why Mitsubishi and Magna decided to partner with an exploration company with the goal of ensuring a constant supply. The finance of the Cauchari project is about \$300 million and this is quite a reasonable amount for a company like Lithium Americas. We are in a good situation: we own the mineral properties, we own the land, we have contracts with people solving the surface issues and so far everything has been going as planned. In 2015 we will start producing and in 2017 we should already be at full production. Our objective is to be among the top three largest lithium producers in the world, if not the largest one,” said Waldo Pérez, president and CEO of Lithium Americas.

Galaxy Resources, an Australian company with producing sites in Australia and China, entered Argentina with the acquisition of Lithium One last year. With assets such as Sal de Vida in the Salar del Hombre Muerto, Galaxy has partnered with Hyundai. Iain Scarr, general manager of Galaxy, is optimistic when it comes to the geology of their assets: “our feasibility study targets 25,000 mt of lithium carbonate, also spinning off 107,000 mt of potassium chloride.”

Considering the geographical positioning of the Lithium Triangle, one can see the benefits of associating with Asian manufacturers. Lithium can be exported through ports in northern Chile, allowing significant savings when shipping the mineral to Asia. “Galaxy Lithium has plans for vertical integration, and is building a battery plant in China as well. The Chinese market is the keystone for our strategy. Earlier this year Galaxy raised \$30 million, partly to fund development at Sal de Vida and partly for completion of the battery plant” said Galaxy Resources’ Scarr.

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Waldo Pérez, president and CEO, Lithium Americas.

## Fertilizers

The Lithium Triangle lies next to one of the most agriculturally intense regions of the world. Given the common conjunction of lithium and potash, a key component of fertilizers, companies find that there is more than just lithium opportunities to exploit.

This is the case of PanAmerican Fertilizer, a company with assets in Argentina, Brazil and Canada. PanAmerican acquired properties that were already producing calcium sulphate at low cost in the province of Santiago del Estero and took them to an industrial level. "Our operations are relatively simple. We take the calcium sulfate from the ground, crush it into different sizes depending on which final product we want to achieve and then we pack it and ship it to the final client. We are now producing 60 mt per hour. Everyone is talking about Vale's Rio Colorado because it is such a huge project but if we get to compare our operations with the planned operations of Vale, we see that we are at a great advantage. This is because while Vale's operations will be very intensive in energy and water, our operations do not require any of these, making us much more economical and with fewer environmental liabilities," said Sebastián Cattáneo, the country manager of PanAmerican Fertilizer.

Similarly to the vertical integration process that lithium companies are undergoing, PanAmerican Fertilizer has partnerships with agriculture equipment manufacturers. "Besides partnering with cooperatives of farmers, we also have agreements with distributors of trucks and specialized machinery for agriculture. They have special equipment that can be used to apply our calcium sulphate. We are selling our clients a fully integrated solution that allows them to lower their costs and to have greater productivity. We can supply regional markets such as Paraguay, Uruguay, Chile and Brazil," said Cattáneo.

## Uranium

The uranium sector in Argentina could be said to be the precursor of the current mining resurgence the country is experiencing. The country has been pushing to develop its uranium resources and process capabilities since the 1960s; the main concern was to dominate the entire chain of knowledge for nuclear reaction.

In Argentina, uranium was considered a strategic mineral and the entire mining process was controlled by the federal government. It was thought to be a mineral apart from others. Guillermo Pensado, vice-president of Calypso Uranium, explained: "Uranium was only explored by the National Atomic Energy Commission, which did a very good job in the 1960s and found the Cuenca San Jorge and Cerro Solo deposits. With these two deposits they realized they had enough to work on for the next 200 years. So they reduced the exploration, shut down all the small mines. Mines like Huemul in Mendoza were closed by the government despite their potential," he said.

Uranium explorers in Argentina are still facing many challenges. Exploration companies have difficulties in financing and fear political risks in Argentina; the government is debating whether uranium should be considered a strategic mineral, with uncertain legal consequences. Another challenge yet to be overcome is the feeling generated by Fukushima events in 2011, as well as the general caution with which investors treat Argentina.

Yet companies such as U308 Corp. continue to see the opportunity provided by fantastic geology. "Argentina is very important to U308 Corp. If you mention Argentina in North America right now, it does not have a positive connotation but I am very bullish about the country. I think this is exactly the time to be making specific investments, when everyone else is running. After what happened to Argentina in 2001, GDP grew at 12% per annum for the next few years. This is an economy that comes back strongly after these crises, and we envisage our mine in Laguna Salada entering production at about the time of the next recovery. This is what sets the province of Chubut apart for us: although there are political complications in the province, we can see a way through, which contrasts with Mendoza, where we have a very interesting uranium project, but it's not yet clear how to overcome the political situation which has not changed in five or six years," said Richard Spencer, president and CEO, U308 Corp.

# Service Suppliers

## Completing the value chain.



Construction begins on Barrick's Pascua Lama mill. It is expected to grind 45,000 mt/d starting in 2014. Photo courtesy of DIN S.A.

Argentina is a country of fantastic potential but its fair share of obstacles. There are treasures in the 5,000 meter mountains of the Andes, but they are not taken with ease; they are to be conquered. At least today, however, there are a range of service providers to assist in the challenge.

Services offered range from specific catering and housing solutions to logistics, fuel supply and engineering adapted to the needs of operations in high altitudes and extreme temperatures.

One of the potential clients of service providers, precious metal producer Minera Santa Cruz controlled by Hochschild Mining, has a clear image of the current stage of development of the Argentinean market of service suppliers. "One of the opportunities for developing local suppliers which the government and mining companies are pursuing is to replace imports. Not so much specific equipment, but some spare parts and supplies can be acquired in Argentina. The other positive change is the development of professionals. A lack of qualified people is one problem we have; rectifying this is very important to the country," said Roberto Cacciola of Minera Santa Cruz.

An interesting example of a company that is rectifying the problems mentioned above is Modular Homes, which began as a supplier of housing solutions to large infrastructure projects carried out by the Argentinean government before its recent shift to focus on mining activities. "In 1996 a new regulatory framework bringing more stability was passed and that gave a great push for the mining industry to grow. Modu-

lar Homes emerged as the best positioned company from our sector to respond to the newly created demand for construction. In 2009 we started constructing housing installations in Pascua Lama," said Antonio Monteiro Román, managing partner of Modular Homes.

"We believe that it is precisely because these workers are in remote locations with challenging conditions that housing and overall accommodation should provide them with comfort. The mining industry is a very tough one and the least we can do is to provide the workers with the best possible living standards and conditions. Moreover, it is a way of attracting workers because it might be difficult to convince someone to work for you if you do not provide the desirable living conditions for them," said Román.

One of the parameters that many service providers try to meet has to do with the requirements of purchasing and hiring from within the provinces in which the operations take place. An example of this is Infa, an engineering company that is part of the Fate-Aluar Group.

"In Santa Cruz we recently opened an office in San Julián; it is a very little branch, but we plan to hire local people. The provinces are pushing very hard to hire local people. For now, we are primarily in engineering and construction but we are constantly expanding our services so we can provide even more comprehensive solutions to our clients in the mining sector. We want to be specialists in welding technology for the mining industry. We put

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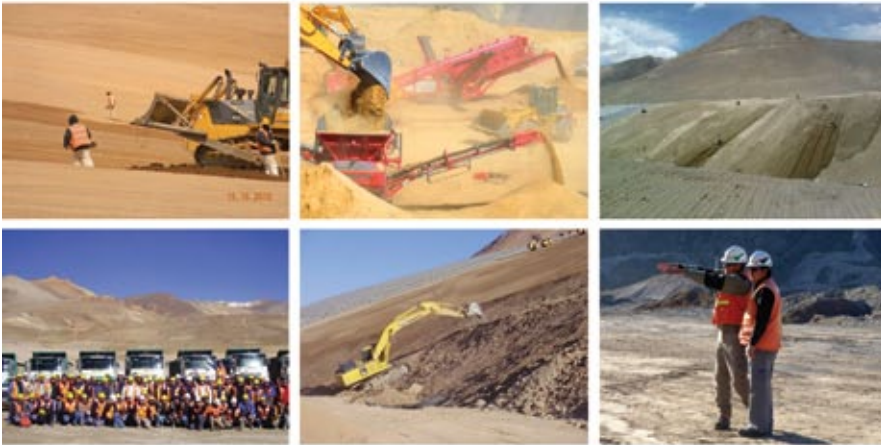
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a lot of effort into training our people as well as successfully managing construction projects," said Ivo Baeck, general manager of Infa.

Local employees and even local companies serve an important purpose. "Mining companies should take advantage of local companies, especially when the work place is somewhere as challenging as the Andes. Foreign companies do not have the in-depth expertise of what these conditions are. We do understand why it is difficult to work in the Andes and that is why we do not fail," said Ante Dumandzic, general manager of Minera Zlato.

Minera Zlato, a company born in San Juan and part of a suite of three companies that operate under the banner of Ivica y Dumandzic. It offers a range of specialised services, extracting value from its combination of local knowledge and technical expertise.

Local companies are raising their offering, increasingly, for example, investing in innovation. DIN S.A. provides the metallic structures that are being used by Xstrata-operated Alumbrera mine. "We chose to invest in technology because this is the way to grow in what we do. All our metallic parts are built using systems that take away human interference in the manufacturing process," said Armando Villarroel, general manager of DIN S.A.

Alejandro Baldo, president of Taging, a growing engineering company, said: "We focused on project management to be able to organize all the intervening specialties. Today we see a very bright future ahead, with many short- to medium-term projects and many business opportunities, allowing us to plan the future years in a different way, even though in Argentina circumstances can change daily."

Considering the transborder nature of many of the geological treasures of the country, companies like Taging, who entered the mining sector with work for AngloGold Ashanti's Cerro Vanguardia and is now helping Galaxy advance its Sal de Vida project, are also targeting abroad.

"Our objective is to have Taging increasingly more recognized as an Argentinean company that is active in all the region. We have a big company's organizational structure combined with the flexibility of a small company. Currently we have a team of 25 people collaborating with a net of different specialist consultants, which gives us the flexibility to work, for example, in the Galaxy Resources project."

Increasingly international experts are opening their offices in Argentina. Alejo



Daniilo Silva, general manager, Hunt Mining.

Oscar Sfriso, general manager of SRK Consulting in Argentina is enthusiastic about the country's potential and has been expanding their service lines with the already available expertise SRK has in the Andes from its Chile office. "If Argentina shares the Andes with Chile that is a world-class destination for mining, there is no reason for one to believe that Argentina does not have an equivalent mineral potential. During the last two years we have worked very hard and we managed to penetrate more deeply into the mining consulting market. Furthermore, we have enlarged our area of expertise and we now have the ability to provide more customer specific consulting in mine planning, hydrogeology among other areas."

Sfriso has understood that in order to do business in Argentina, one should also feel committed to the country: "We have not come here with any short-term expectation but we are rather looking at the larger picture. We want to grow with the industry."

### Conclusion

Argentina faces significant problems: rising inflation, currency exchange restrictions and national debts numbering among them. Yet a large well-educated population, sophisticated industries and geological potential also are very much in evidence.

Hunt Mining's Silva synthesized what is being observed in Argentina right now. "Because Argentina has a very special federal arrangement, mining can help the provinces develop themselves and better connect this country by diminishing the regional economic differences. When this generation of geologists was still at university, many of us did not consider Argentina as a mining country. This opinion was valid until a few years ago, but with our recent achievements we are glad to see that Argentina is now becoming a mining country again."

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