

## ARGENTINA

*By George Sanders*

**A**rgentina is hanging on with a peso still fixed 1-to-1 with the US dollar and is slowly clawing its way up through a deep economic recession that has been going on for three years. After shrinking by over 3% in 1999, the economy failed to grow in the year 2000 and will probably stay flat this year also. The mood is sombre and, despite interest rate cuts in the US, small businesses in Argentina are still faced with borrowing costs that are unacceptably high, and official unemployment and unofficial underemployment remain stuck at record levels.

President Fernando de la Rúa has survived a major bribery scandal that led to the early resignation of the Vice President. In March the Minister of Economy resigned and was replaced by another who lasted only a short while, and Domingo F. Cavallo, who occupied the same post of Minister of Economy under former President Menem, was called in from a splinter party outside the ruling alliance coalition and given 'super powers' to try to improve Argentina's competitiveness and pull the country out of its economic tailspin.

Argentine industry is still non-competitive by world standards for reasons ranging from public sector inefficiency, to fiscal mismanagement in the provinces, corruption, high labour overhead costs, high fuel taxes, high telecommunications costs, an inefficient, costly and time-consuming legal system, and a myriad of idiosyncrasies peculiar to Argentina which have been institutionalised over the years by special interests afraid of change. There are periodic rumours of impending devaluation of the Argentine peso as a way out of the current economic crisis, but hardly anyone supports devaluation and no one seems to have a viable alternative with memories of hyperinflation still on everyone's minds.

Mining output peaked in 1999 with the initial high-grading of ores containing copper-gold at the Bajo de la Alumbrera mine and gold-silver at the Cerro Vanguardia mine, and production has dropped slightly in 2000 and 2001. Mining represents just less than 1% of Argentina's gross national product and about 3% of Argentina's exports. This pales in comparison with the oil and gas sector's 6% contribution to the country's gross national product and 18% of its exports. Apart from the now suspended Pascua-Lama project (Barrick) and the nearby Veladero project (Homestake-Barrick), there have been no feasibility or pre feasibility studies undertaken for two years now, and optimistic projections of mining's growth have to be adjusted to the realities of the world metals markets plus factors particular to Argentina, foremost among which are taxes on mining and the overall high cost of doing business in the country.

A bright spot in exploration is the recent granting of a huge exploration concession in central Patagonia over one of the world's largest (and previously unrecognised) layered ultramafic intrusive complexes believed to contain Pt-Pd mineralisation. On the mining side, Yamana has begun production of bonanza-grade direct-shipping silver ore from the Martha mine in Patagonia and the long-standing dispute between Catamarca province and the national government over royalties from the Bajo de la Alumbrera mine is drawing to a close.

Little has changed for mining since the De La Rúa government took over in December of 1999. After eliminating the position of Mining Sub-Secretary last year, the government has created a Secretariat of Energy and Mining, thus restoring mining's profile somewhat. Almost the only significant advance in over a year is the impending sanction of the regulations for the reform of the Mining

Investment Act, which will permit the yearly reimbursement of VAT to exploration companies. The reform bill will also bring the withholding tax on foreign interest payments back down to its former level, clarify calculation of the depreciation allowance for federal income tax, and reinforce the promise of 30-year tax stability for mines. 2001 will see the end of the World Bank Pasma programme, which has provided some of the key mining provinces in the northern and central Cordilleran portions of Argentina with modern tenure-tracking systems. The Pasma programme has received mixed reviews from the international exploration companies and it will now be up to the Energy and Mining Secretariat to find continued political and financial support to keep the programme going.

<b>Exploration Expenditures and Drilling</b>		
<b>Year</b>	<b>Expenditure US\$ (millions)</b>	<b>Metres</b>
1997	130	181,000
1998	100	240,000
1999	80	235,000
2000 <sup>p</sup>	110	230,000
2001 <sup>e</sup>	100	225,000

*data from Argentina's Energy and Mining Secretariat*

<sup>p</sup> provisional, <sup>e</sup> estimated

Ownership of the two minority interests in Minera Alumbraera, the company which mines the Bajo de la Alumbraera deposit in northwest Argentina, changed during 2000 as Rio Tinto assumed North's 25% interest and Billiton claimed Rio Algom's 25% share as a result of corporate takeovers. MIM Holdings remains the majority shareholder with a 50% stake. Mining takes place under a joint-venture agreement with the owner of the mineral rights, Yacimientos Mineros de Aguas de Dionisio (YMAD), a statutory corporation with representatives from the provincial government of Catamarca, the University of Tucumán and the national government of Argentina, which will start earning 20% of the net (before tax) proceeds once the project

capital plus interest has been repaid. Minera Alumbraera pays a 3% after-cost royalty to Catamarca province that will be increased somewhat next year with the passage of a national law that took away the right to deduct capital amortisation, or depreciation, from the royalty cost calculation. The provincial legislature is currently debating legislation designed to adhere to the new federal law, which will end a long-standing royalty dispute with the national government in which the province claimed a 3% royalty with no cost deductions that would have almost doubled the royalty payments. Commercial production of doré and copper-gold concentrate began in February 1998, and in late 1999 the US\$1.2 billion project met the production, efficiency, physical facilities, financial and legal performance test required under its project financing.

<b>Argentina's mineral exports (US\$ million)</b>	
<b>Year</b>	<b>Value</b>
1997	302
1998	659
1999	775
2000 <sup>e</sup>	708
2001 <sup>e</sup>	723
2002 <sup>e</sup>	749

*data from Argentina's Energy and Mining Secretariat*

<sup>e</sup> estimated

High-grading of the near-surface portions of the deposit yielded above-design production of over 199,644 t of copper and 721,948 oz of gold in 1999, and substantial operating improvements put Bajo de la Alumbraera among the lowest-cost world copper producers. Year 2000, though, was a different story. Owing to a combination of lower than anticipated grades and lower mill throughput, copper production dropped to 145,198 t and gold production fell to 528,216 oz, while cash costs increased a few cents to US\$0.34/lb.

During 2000 the management structure was simplified, overheads reduced and some of MIM's best managers were transferred to Alumbraera. Mill availabilities and throughput, metallurgical performance and contained copper output improved significantly for the December quarter, signalling an appreciable turnaround in operating performance. Mill

throughput and Au/Ag recoveries improved to the previous year's levels towards the end of 2000.

Early in 2000 expansion plans were postponed indefinitely and forecast production levels for 2001-05 were set at an average of 610,000 t/y of concentrate, containing approximately 166,000 t of copper-in-concentrate and 510,000 oz of gold contained in concentrate and doré. The mine life was also estimated to be 15 years. However a revised long-term plan for the business is currently being prepared, which may alter these projections. Drilling by MIM of targets in search of more mineral resources on YMAD-held satellite properties in a 250 km<sup>2</sup> area adjacent to the Bajo de la Alumbrera mine continues, without the involvement of Rio Tinto and Billiton.

The Cerro Vanguardia open-pit silver-gold mine has been producing at approximately 2,000 t/d since the last quarter of 1998, and the US\$270 million project has met the operational requirements of the Senior Lender Technical Completion Tests and has received its Certificate of Completion. The mine draws ore from six different pits from different epithermal, low-sulphidation quartz veins hosting bonanza-type silver-gold mineralisation. Early high-grading of the veins led to a record 1999 production of approximately 324,000 oz of gold and approximately 3.62 Moz silver, well above the forecast annual production rate of 250,000 oz gold and 2.8 Moz silver. However, weather-induced production problems during the austral winter of 2000 lowered gold-silver production and increased cash costs somewhat. The mine produced approximately 285,000 oz gold and 1.58 Moz silver in 2000. Reserves as of December 31, 2000 stand at

<b>Selected Argentine mineral production (t except where stated)</b>				
<b>Commodity</b>	<b>1998<sup>r</sup></b>	<b>1999</b>	<b>2000<sup>p</sup></b>	<b>2000<sup>e</sup></b>
Gold (kg)	20,400	38,515	25,954	26,388
Copper	170,273	210,126	145,197	178,366
Silver (kg)	35,768	73,788	78,271	189,609
Zinc	35,560	34,192	33,761	34,300
Lead	15,004	14,256	14,115	13,680
Borate	279,272	565,647	334,000	N/A
Bentonite	131,320	128,810	167,600	N/A
Gypsum	650,356	492,870 <sup>p</sup>	712,000	N/A
Lithium Carbonate	6,362	1,280	1,374	1,200
Lithium Chloride	2,221	2,831	5,210	5,000

*data from Argentina's Energy and Mining Secretariat*

*<sup>r</sup> revised, <sup>p</sup> provisional, <sup>e</sup> estimated, N/A Not available*

8.5 Mt grading 9.4 g/t Au and 130 g/t Ag at a cut-off grade of 4.0 g/t Au.

Cerro Vanguardia owns the right to exploit the various epithermal Au-Ag veins in the district for 40 years. The company is owned equally by AngloGold and by Argentine oil and gas producer Perez Companc. The province of Santa Cruz holds a 7.5% minority interest in the project. The Cerro Vanguardia mine pays an after-cost royalty to the province of 1% of the value of mine production, as per Federal guidelines. Exploration within the mine area will soon add another 0.5 Moz gold-equivalent reserves, and Cerro Vanguardia is actively exploring the large concession block surrounding the mine.

Mina Aguilar (Comsur) in northwest Argentina is mining approximately 2,000 t/d of combined 11% Pb-Zn ore grading approximately 3.2% Pb, 7% Zn and 85 g/t Ag from two underground orebodies, Cerro Aguilar and Esperanza. In May, construction is set to begin on a brand new processing plant expected to cost US\$5.5 million and be operational by December. Concurrently, Mina Aguilar is funding a 38 km, US\$5 million natural gas pipeline connecting the mine with the Gasoducto Nor-Andino at Tres Cruces to supply a new gas turbine plant that is expected to be up and running by September.

The mine has a reserve-plus-resource base of approximately 11 years. Jujuy province allows a 1% deduction of exploration expenses from the 3% after-cost royalty.

Low prices for gold and silver have led to the suspension of construction on Barrick Gold's huge Pascua-Lama project in the northern part of the El Indio District, which straddles the Chilean border in San Juan province, and the company said that a decision to resume work will not be made until the gold price improves. Pascua-Lama was slated to begin producing 800,000 oz/y of gold and 35 Moz/y silver beginning in 2003. Following suit with the rest of the world's gold producers in recalculating the value of projects using a lower gold price, Barrick has taken a non-cash provision of US\$790 million to reduce the carrying value of the Pascua-Lama project on its books during the fourth quarter of year 2000. This comes at the same time that Barrick's estimate of total project cost escalated 26% to US\$1.2 billion. Permitting applications and engineering studies are continuing on a redesigned tailings dam and the cross-border conveyor tunnel from the future Pascua pit to the mill which will be located in the Rio Turbio valley in Argentina, but road construction on the pioneering year-round, low-elevation access to the Valle del Cura from the Argentine side has been halted.

As of December 31, 2000, the main Pascua-Lama deposit had 269 Mt of proven-plus-probable reserves grading 1.95 g/t Au and approximately 66 g/t Ag at a 1.1 g/t Au cut-off grade. The separate Filo Norte area near the limit with the adjacent Veladero project contains an additional 16.3 Mt of proven-plus-probable reserves grading 1.2 g/t Au and approximately 23 g/t Ag. Beneficiation will be via milling of a non-refractory ore that will be processed by conventional cyanide leaching to produce gold-silver doré, and a refractory ore that will undergo conventional flotation concentration to produce a copper-silver-gold concentrate. Unlike the neighbouring volcanic-hosted, thoroughly oxidised Au-Ag

mineralisation at the Veladero project, the majority of the mineralisation in granites at the basement-hosted Pascua-Lama project is not amenable to heap leaching.

Drilling continues at a reduced pace on the Veladero project (Homestake 60%, Barrick 40% joint venture) which lies entirely within Argentina immediately adjacent to the Lama portion of Barrick's Pascua-Lama project, and constitutes the eastern end of the Pascua-Lama-Veladero trend of high-sulphidation epithermal gold-silver mineralisation at the northern end of the El Indio District. Metallurgical, hydrological and geotechnical testing is under way and a decision is expected on whether or not to build a mill or proceed with heap-leach only, as the project moves towards a feasibility study. Under the conventional mill plus heap-leach scenario, the open-pit Veladero project would mine 11,000 t/d mill feed and 25,300 t/d heap-leach material for ten years, producing an estimated 500,000 oz/y gold. The heap-leach only scenario would mine between 250,000 and 350,000 t/d. Project cost would be at least US\$450 million and start-up would be in 2003.

As of January 1, 2001, measured open-pit reserves at Veladero at a cut-off grade of 0.5 g/t Au are 194.3 Mt grading 1.46 g/t Au and approximately 21 g/t Ag. There is a high-grade portion of the deposit that contains 18.5 Mt grading 4.97 g/t Au and 47.9 g/t Ag. Homestake has updated earlier engineering studies using a higher cut-off grade, and as of January 1, 2001, the Veladero project's global indicated reserves plus inferred resources at a cut-off grade of 0.5 g/t Au totalled 381.3 Mt grading 1.24 g/t Au and approximately 18 g/t Ag. Veladero is a Provincial Reserve Area with mining rights held by the San Juan provincial mining company Instituto Provincial de Exploración y Explotación Minero. IPEEM will receive a future royalty on net (before tax) proceeds once the project capital plus interest has been repaid. San Juan province will receive a

production royalty of 3% of pit-head value (after-cost) according to Federal guidelines.

Homestake is also exploring its properties along the Argentine side of the El Indio belt, and satellite properties near the Veladero project in the Valle del Cura. Programmes by IMA and TNR-Solitario in joint venture with Barrick to explore properties near Pascua-Lama are also ongoing. Low metals prices kept Peñoles from mounting a 2000-01 field programme on the Jagüelito Provincial Reserve Area that is being explored together with IPEEM, which holds the mineral rights. Since acquiring Battle Mountain Gold (BMG) last year, Newmont has closed the office in Argentina but continues to evaluate the BMG properties, mainly in San Juan province.

Approximately 80 km to the north, joint-venture partner Rio Tinto is funding Tenke Mining's second season of exploration on the Vicuña Cu-Au-Ag prospect that straddles the border between Chile's Region III and northern San Juan province in a major altered zone between the Maricunga District to the north and the El Indio District to the south. Under the now fully ratified Chile-Argentina cross-border mining treaty, the company is working freely on both sides of the border within the project limits. This treaty is greatly enhancing access to the remote Argentine portion of the highly prospective central Andes, allowing free movement of personnel and equipment across the border during the exploration season. Strongly anomalous Cu-Au-Ag has been discovered in two holes in the first RC drilling on the project in the Filo del Sol target. A second RC rig has been mobilised to test geophysical and geochemical targets throughout the property in search for mineralisation typical of the high sulphidation epithermal systems in this portion of the central Andes. Rio Tinto has also entered into an agreement with IMA Exploration to explore the adjacent Mogote project lying directly south of the Vicuña property.

El Pachón, the porphyry copper deposit in San Juan Province, is a 50-50 joint venture between Cambior and Cia Minera San José (Comsur). Cambior, for corporate reasons, has expressed a desire to sell its interest for some time now. The logical purchaser is Chile's Luksic Group, operator of the adjacent US\$1.36 billion Los Pelambres mine on the Chilean side of the border, and talks are believed to be underway to acquire Cambior's portion of the deposit. El Pachón-Los Pelambres district was the first 'straddle' project envisioned by the Argentina-Chile Mining Integration treaty, and the remote El Pachón portion will become economic in the future under this treaty. El Pachón has reserves of 880 Mt, at a cut-off of 0.4% Cu containing 0.62% Cu, 0.015% Mo, 0.02 g/t Au and 2.4g/t Ag.

The large Agua Rica copper deposit (BHP 70%, Northern Orion 30%) in Catamarca province near Bajo de la Alumbrera is on privately staked ground with no provincial ownership to burden project economics. This is unlike other prospects in the area, which are controlled by the Catamarca provincial mining company. The high-grade part of the deposit at a 1% Cu cut-off contains a resource of 60 Mt at 1.3% Cu and at 1.74% Cu-equivalent when Au and Mo credits are included. The global resource at Agua Rica at a 0.4% Cu cut-off is 802 Mt grading 0.61% Cu, 0.24 g/t Au and 0.04% Mo. Two bulk-sampling adits were driven into the deposit before exploration work ceased three years ago, and metallurgical tests were positive. Despite this, BHP does not consider Agua Rica to be economic at current copper prices and the project has not found an international suitor willing to take it to feasibility. Northern Orion's San Jorge deposit in Mendoza Province has an indicated and inferred resource of 57.3 Mt grading 0.61% Cu at a 0.25% Cu cut-off based on open-pit mining and heap leaching of oxide and secondary-enriched copper for SX/EW recovery. Development plans are currently stalled for this project.

Operating losses brought on by low silver prices over more than a decade drove Sunshine Mining and Refining into bankruptcy last year and prompted de-listing of this charter member from the New York Stock Exchange after more than 100 years. The company emerged from bankruptcy in February 2001 only to be informed by its sole customer that it would no longer be accepting its US concentrates for smelting. This prompted closure of the Sunshine mine in Idaho, leaving the Pirquitas project in Jujuy province in northwest Argentina as Sunshine's only viable option to continue as a silver producer. The reorganised company is committed to developing the Pirquitas deposit, but continued low silver prices are preventing Sunshine from going forward.

The old Pirquitas mine in the Puna (Altiplano) region of northwest Argentina is the southernmost of the 'Bolivian tin belt' type deposits and has a supergene silver enrichment blanket. It was operated as an underground tin-silver mine from 1935 until the 1980s. Sunshine's plan, after five years of exploration and a full feasibility study and two optimisation studies, is to mine and process 9,600 t/d of ore via modern open-pit methods to produce silver concentrate, tin concentrate and zinc concentrate. This fully permitted project will require at least US\$133 million to develop and has 30.4 Mt of proven and probable reserves grading 128 g/t Ag, 0.17% Sn and 0.81% Zn with demonstrated upside potential to increase reserves substantially once mining begins and currently inaccessible areas can be reached for exploration drilling. At 128 g/t Ag Pirquitas has twice the silver grade of the 62 g/t San Cristobal deposit that, despite the depressed world outlook for silver, is currently being developed by Apex Silver in a far more remote location in neighbouring Bolivia.

The Cordón de Esquel project in Chubut province has received a lot of attention this year, as drilling by Minera El Desquite continues to add to gold-silver resources in six separate epithermal silica veins

(Galadriel, Galadriel Sur, Elena Norte, Elena Sur, Julia and Antonia). The company has drilled a total of 33,500 m in three separate campaigns since 1999, and a fourth 20,000 m campaign was begun in February 2001. After unsuccessfully shopping the project to major gold mining companies last year, the company has decided to continue drilling on its own. Pincock, Allen and Holt has performed ongoing resource audits on the Esquel project, and a prefeasibility study is now under way by majority owner Brancote Holdings incorporating a preliminary mining plan being drawn up by Australia's Resource Services Group. As of February 2001, the six different areas together contain a total high-grade resource (measured, indicated and inferred) of 9.4 Mt at 10.6 g/t Au and 16.5 g/t Ag at a cut-off grade of 5 g/t Au. Using a cut-off grade of 2.0 g/t Au, the same areas contain a resource (measured, indicated and inferred) of 14.6 Mt at 8.0 g/t Au and 13.0 g/t Ag. Minera El Desquite is owned 60% by Brancote Holdings of the UK, which has decided to focus all its efforts on the Esquel project in Argentina and to rationalise other investments and projects. The remaining 40% is held by Grand Concourse (GC), a private Argentine-based group of investors which includes the Kerry Packer interests of Australia and the Miguens Bemberg family, principal owners of the large industrial Bemberg Group of Argentina.

Yamana Resources reached a significant milestone in Argentina's mining history with the announcement that it has started ore production from its high-grade underground Martha mine located in Santa Cruz province in southern Argentina. This is the first small-scale project to be successfully completed since the new mining laws were passed and the country was opened to exploration a decade ago. It demonstrates that a small company can successfully exploit the high-grade gold-silver veins in southern Patagonia by underground mining methods. Exploration has waned here in recent years after the large mining companies did not find the disseminated gold and silver deposits

amenable to open-pit mining they were searching for. Activity by the smaller mining companies will certainly lead to more and more discoveries and perhaps soon bring the majors back to this largely unexplored region which has not been dissected by erosion and which still hides its potential riches.

The first ore from one of four small bonanza silver pockets identified so far at the Martha mine is being shipped directly to Noranda's Horne Smelter in Quebec, Canada, with no on site concentration. Initial access to this first ore pocket is via a 196 m decline completed in two months by an independent mining contractor. Yamana expects to produce about 3.25 Moz equivalent silver from 5,000 t of material with an average silver-equivalent grade of 20,249 g/t during this first phase of a four-phase mining programme. Northgate Exploration is providing a total of US\$4 million in structured financing for development of the Martha mine and Royal Gold holds a 2% net smelter royalty on all mineral production from Yamana's properties in Santa Cruz province. Yamana Resources recently acquired Platero Resources, a private company, which holds three properties adjacent to the Martha mine and another near Yamana's Martinetas project in the eastern part of the province. The Martinetas project holds similar promise for bonanza-grade gold ore shoots within the Coyote Vein.

The Manantial Espejo project is the second largest epithermal gold-silver vein district in the Deseado Massif after Cerro Vanguardia. Silver Standard Resources has an option to acquire 50% of Black Hawk Mining's 80% share in the Manantial Espejo project with Barrick holding the remaining 20% with a one-time back-in right for an additional 20% at feasibility. Year 2000 diamond and RC drilling tested new veins on the property and expanded known mineralisation in previously drilled vein structures with bonanza-style ore shoots similar to, but not quite as rich as, those being mined at Mina Martha. The Manantial Espejo project has reserves and

resources (open-pit) in all categories totalling 7.9 Mt at 191 g/t Ag and 2.87 g/t Au. Plans to move the project towards a full feasibility study incorporating both underground and open-pit mining methods are dependent upon improved gold and silver prices.

Barrick has handed back the Diablillos project in northern Catamarca province to Pacific Rim and project status is uncertain. Open-pit resource estimates by Pacific Rim on this volcanic-hosted epithermal precious metals prospect stand at 49.5 Mt at 68.3 g/t Ag and 0.42 g/t Au at a cut-off grade of 0.4 g/t Au-equivalent. At the 0.8 g/t Au-equivalent cut-off required for a standard milling operation, Diablillos contains a resource of 30.7 Mt at 92.7 g/t Ag and 0.60 g/t Au.

Mansfield minerals continues to be the most active explorer in the Puna region of Salta and Jujuy provinces. Its Rio Grande Au-Cu project has been joint-ventured by Teck Corp. Teck has handed back the Cerro Samenta porphyry copper prospect to Mansfield after resuming drilling in 2000 that was cut short in 1998 by a third-party lawsuit over title. Sunshine was forced to return the Aguas Calientes prospect in Jujuy to Mansfield for corporate reasons even though drill results in this epithermal, high-sulphidation system confirmed some very interesting gold-silver values. Cominco and Rio Tinto have small exploration programmes for zinc in the sedimentary basin surrounding the Aguilar mine in Jujuy and Peñoles continues to explore in the Puna region of Salta.

Viceroy Resource Corp. completed purchase of 100% of the Gualcamayo project in San Juan province from Mincorp and drilled the newly discovered epithermal-style disseminated gold mineralisation at Quebrada del Diablo within this large limestone-hosted skarn district. Results showed low-grade disseminated gold potential but they were not sufficient to keep the project advancing. Last year's geologic resource by Viceroy's own estimate at Quebrada del Diablo was 37.2 Mt at 1.13 g/t

Au and this will be updated to include results of recent drilling. This is in addition to substantial resources indicated in the skarn portion of the system explored by Anglo American in the late 1980s.

Golden Peaks continues to explore for gold in the Sierra de las Minas in the eastern portion of La Rioja province. The Los Menucos area of northern Patagonia's Rio Negro province is seeing ongoing exploration for high-sulphidation epithermal gold in Mesozoic acid volcanic rocks of the large Somuncurá Massif. Rio Tinto (in joint venture with APAC Minerals), Normandy Mining and IAMGOLD (in joint venture with Companhia Vale do Rio Doce) are the main players at Los Menucos.

In Chubut province, Consolidated JABA, Inc. and Southwestern Gold Corp. have announced the filing of 191,800 ha of exploration concessions over what is believed to be one of the world's largest unexplored layered ultramafic complexes. Regional stream sediment and rock sampling by the Argentine geological survey, SEGEMAR, in the late 1990s confirmed that this complex, in the Tecka and Tepuel mountain ranges of Chubut province, contains anomalous platinum-group metal values. Exploration by the joint venture is set to begin in April 2001.

Mauricio Hochschild & Cia. of Lima, Peru, has begun exploration work on the Pluma/Cerro Saavedra property in joint venture with owner Minera Andes. Hochschild is a privately held polymetallic and precious metals mining company specialising in mining vein-hosted metal deposits. Since staking the property in 1997, Minera Andes has obtained bonanza-type gold-silver values from RC drilling on the property during various exploration campaigns, and has focused in on the Huevos Verdes epithermal quartz vein. The property shows similarities to the bonanza-type precious metals veins at Cerro Vanguardia, Manantial Espejo and the Martha vein elsewhere in the Jurassic-age volcanic plateau in the centre of Santa Cruz province.

The Cerro Negro project (MIM Holdings) has been farmed out to Australian junior Oro-Plata Resources. Cerro Negro hosts several low-sulphidation epithermal gold-silver veins and lies immediately south of Cerro Saavedra-El Pluma. In the west-central part of the Deseado Massif, IAMGOLD is exploring the Esperanza prospect and has a joint venture with Rio Tinto on Las Mellizas.

A summary list of companies actively exploring for new targets in Argentina reads as follows: Rio Tinto, MIM, Barrick, Homestake, Mansfield Minerals, IAMGOLD, Tenke, Brancote Holdings-El Desquite, JABA-Southwestern Gold, Teck, Cominco, Peñoles, Normandy, Meridian, Yamana, Golden Peaks, IMA, Mauricio Hochschild, and Oro-Plata Resources. This list is considerably shorter than in previous years.

FMC Lithium continues to produce lithium chloride from its US\$137 million Fénix project high-tech brine plant located at the Salar del Hombre Muerto in Catamarca province, but full-scale production of lithium carbonate remains suspended owing to price pressures by Chilean producers. Subject to certain conditions, FMC Lithium is committed to investing US\$6 million to extend the future natural gas pipeline from Pocitos in Salta province south to its mine, in hopes of resuming lithium carbonate production. Rio Tinto Borax continues to produce borates from Tincalayu in northern Argentina, but no significant new investment has been undertaken. A number of small borate mineral and boric acid producers also continue working in the region. The German company Kali und Saltz has reached an option agreement with Grupo Minera TEA to re-evaluate the feasibility study done in the mid-1990s by Rio Tinto on the large Rio Colorado potash deposit in the Neuquén Basin in southern Mendoza province. There has been no news about the nearby Los Petisos sulphur deposit, also in the Neuquén Basin. Yesos Ynauf of Germany has begun production of gypsum wallboard in Mendoza.

Still at the talking stage are various infrastructure projects destined to benefit mining directly. They include the above-mentioned branch of the Gasoducto Andina south to the Salar de Pocitos and possibly further south to FMC's plant at Salar del Hombre Muerto, railroad improvements linking mining projects in the Puna region westward to the port of Antofagasta and eastward to ports on the Paraná River, and a 550 kV electric line from southern Mendoza province to the mining projects in the Valle del Cura and farther north. All these infrastructure projects presume a certain percentage of funding from the individual provinces making it very difficult to put together agreements because the provinces are so strapped for cash and are often at cross-purposes with their neighbours. The companies whose mines and advanced stage projects would stand to benefit from infrastructure improvements are interested in contributing their share of the up-front capital for these projects in return for tangible tax benefits later on. So far, however, no one has

been able to reach any significant agreements with the individual provinces.

Argentina's mining sector has fallen behind its own growth projections, and has not been able to keep pace during the current trough in metals prices. Even so, this farm and cattle country has come a long way from where mining was 12 years ago. Up from essentially nothing, Argentina now competes for exploration dollars with Peru and Chile. The mines currently producing are all (or almost all) subject to excessive provincial ownership, control and royalty taxation. This will diminish in the future as exploration continues away from the known occurrences still under provincial control. Mineral concessions have become free in many provinces since nowadays staking must be paid for up front. Attractive prospects in Argentina remain undrilled, and the country as a whole is underexplored in comparison with its neighbours.