

Mining in QUÉBEC

As the province's gold and iron camps witness a true renaissance, exploration in new areas unveils great potential in other commodities.

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Cover photo: Canadian Malartic open-pit gold mine in the Abitibi (courtesy of Osisko Mining Corp.)

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NOVEMBER 2011

Québec: Rediscovering a Vast Mining Territory

The province is attracting fresh investments to traditional mining areas, as well as opening up the immense potential of the Greater North.



Photo courtesy of Osisko

Québec is a great place for mining, as its Fraser Institute ranking as the world's top mining jurisdiction for three years running bears witness. It fell to fourth place in the latest survey, but is still considered a tantalizing location for a sector boasting healthy growth figures. According to the Québec Mining Association (AMQ in French), investments in exploration and development have increased from less than C\$1 billion in 2005 to C\$2.5 billion in 2010, with expectations of reaching C\$3 billion by the end of this year. The province has benefited from high metal prices and mining exports in 2010 amounted to C\$6.8 billion, C\$5.2 billion of which came from metallic mining.

In terms of volume, it is gold and iron ore that steal the spotlight. Gold production has remained quite flat over the last years, between 750,000 and 900,000 troy ounces/y (810,000 oz/y in 2010); however the addition of Canadian Malartic in 2011, a large open-pit mine operated by Osisko (a remarkable story of a junior company becoming a large producer in a record period of time), is already having a significant impact on the province's gold output, expected to reach more than 1.1 million oz/y this year and roughly 1.4 million in 2012. On top of this, Goldcorp's upcoming investment at Éléonore in the James Bay will also bring an additional 600,000 oz/y.

With regard to iron ore, the Labrador Trough area, around the border of Québec and Newfoundland and Labrador, is home to an exploration and development frenzy, with all active players expanding their current operations, including Rio Tinto IOC and

ArcelorMittal. Other large players, such as China's WISCO and India's Tata Steel, are also present through partnerships in advanced exploration projects. The latest big news on the mergers and acquisitions front was the takeover of iron ore producer Consolidated Thompson by U.S.-based Cliffs Natural Resources, in a transaction valued at C\$4.9 billion.

Production of iron ore attributable to the Québec province in 2010 was 17 million mt/y, an 18% increase year-on-year. Other significant commodities on the metallic side include silver (4.1 million oz/y in 2010), nickel (28,000 mt/y), zinc (201,000 mt/y) and copper (24,000 mt/y).

Not number 1 anymore. Why?

The latest Fraser Institute's Survey portrays Alberta, Nevada and Saskatchewan as better places to do mining than Québec. This is probably due to the hike in mining duties and the uncertainty over changes to the province's mining regulations. On their side explorers, who enjoy a very favorable framework with some pretty unique tax incentives, point at a more restricted access to land as a negative trend. "The government has defined a number of protected areas to comply with international commitments, which is something we support as an association. The problem lies in the way you do this. Currently, 9% of the territory is protected, but as an industry we have not really been consulted. A further 3% needs to be defined as to comply with the 12% commitment by 2015, yet we hope that this will be done in closer consultation with the mining and forestry companies, as well

as the locals. If you add other areas where exploration is restricted, 20% of the territory is not accessible. That is a lot," said Ghislain Poirier, President of the Québec Mineral Exploration Association (AEMQ).

Pierre Bertrand, CEO of government-owned exploration company Soquem, said: "It would be great to have thorough studies done so as to confirm the inexistence of geological potential where a protected park is going to be created; however the sums needed for that would be colossal. Furthermore, the mining industry is not the only one that would be affected as other industries could be interested in a particular territory, like the forestry industry. There is a need to accommodate the interests of everyone and that is certainly a difficult task."

The fact that in the past the Québec government has had to pay for the remediation of abandoned mining sites has also prompted new demands from the general public for the mining sector to contribute more to



Ghislain Poirier, President, AEMQ



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the province's coffers. The increased mining duties of 16% (as compared to 12% before), combined with high metal prices, will boost the province's revenues by 328% between 2010 and 2015, from C\$327 million to C\$1.4 billion, according to the AMQ. The new regime will tax profits on a mine-per-mine basis, thus preventing companies from reducing the taxable profits in one particular operation with the losses in another one.

In parallel to this, the environmental regulations are also becoming stricter. Soon mining companies will have to provide a deposit of 100% of the costs of mine remediation before mine closure, as opposed to 70% now. The period to give this money will also be shortened. "The government of Québec is probably responding to the perception that there has not been enough regulation in the past. From what I have seen, the new rules are generally aligned with the industry's best practices anyway, so investment will not stop pouring into Québec," said Lithium One President and COO, Patrick Highsmith.

Tyler Mitchelson, President and CEO of Royal Nickel Corp., a company advancing the Dumont nickel project, points at Québec's stability as a very important aspect.

"It is not easy to get a permit here, but it is an extremely transparent process and harmonized with the federal system. In other provinces and countries, the process is no longer as transparent and easy to follow."

Xstrata Zinc's vice president of operations, Jean Desrosiers, thinks along the same lines. "In Québec, the rules of the game are very clear. If you do the right things and engage the right people from the beginning, the outcome is quite predictable; you know that you will get your permits," he said.

Stability is indeed a key aspect for long-term investment. As the world requires an increasing amount of resources, the security of supply is paramount. If all the procedures are done in the right manner and the permits are in place, it is assumed that an operating mine in Québec will only have to worry about global metal prices and its own operational challenges, but not about the government causing production to halt. If investors and final users of commodities have arrived in the region to explore the potential of Québec in strategic minerals like lithium, niobium and rare earths among others, it is not just because they see the province's great geological upside, but also because they know they stand a good chance of putting deposits into production here.

Social acceptability

To maintain its privileged position, the industry needs to find the formula to grow sustainably and obtain social acceptability in the process, as well as to find enough people to enable this growth; a major headache that is common worldwide. In this huge territory, where mining has been traditionally concentrated in a few specific spots, the assumption that 'Québec is a mining province' is probably misguided and has the negative effect of making the industry rest on its laurels.

As anti-mining groups have gained strength, the industry has finally responded with the recent creation of Minalliance, a communication-oriented coalition that includes the two main industry associations, the AMQ and the AEMQ.

"The mining industry in Quebec is under severe attacks by a number of special-interest groups. We are not communicating properly the benefits of the industry. That became evident from the Auditor General's report that led to a raise of mining royalties. Changing the industry's image in a meaningful way requires a long-term effort," said Normand Champigny, chairman of the board of Minalliance.

While towns like Val-d'Or and Rouyn-Noranda are definitely mining towns, with

Mining in Québec in the 21st Century: the Era of Social Acceptability

By Frank Mariage,
Partner, Miller Thomson LLP

In 2006, the National Assembly of the Province of Québec enacted the Sustainable Development Act, whose purpose "is to establish a new management framework within the Administration to ensure that powers and responsibilities are exercised in the pursuit of sustainable development." The era of promoting sustainable development in government legislation had begun; it was therefore only a question of time before existing mining legislation would be affected by this noble objective.

In May 2011, after a first failed attempt (Bill 79 was presented in December 2009 and never made it through the legislative process), the Minister for Natural Resources and Wildlife, Serge Simard, presented Bill 14 entitled "An Act respecting the development of mineral resources in keeping with the principles of sustainable development." The bill proposes a series of amendments to the Mining Act, including a change to the title, which is proposed to be the same as Bill 14.

The bill proposes changes to obligations of mining claim and mining lease holders, such as: the obligation to inform a land owner within a delay of 60 days following the registra-



Frank Mariage, Partner, Miller Thomson LLP

tion of a mining claim; the obligation to inform the municipality at least 90 days before work on a mining claim is to begin; annual reports to be filed on work performed and to be performed on a mining claim; the Minister given authority to refuse or to terminate, at any time, a mining lease in the public interest; the obligation to submit a rehabilitation plan and to furnish a guarantee covering the costs of such plan at the beginning of the process; the grant of mining lease subject to the holding of public consultations by the applicant and the setting up of a monitoring committee to ensure that the undertakings

made by the applicant in public hearings are carried out; and the exclusion from mining exploration and operations of areas located in an urbanization perimeter or an area dedicated to vacationing (for any work on such excluded claims to be carried out, a holder will need the consent of the concerned local municipality, and no compensation will be provided for any consequence resulting from the failure to obtain such consent).

To date, the bill has not been well received by the industry or by environmental groups, each group opposing it for completely different reasons. The government has begun consultations on the bill, which is expected to go through the usual legislative process this fall.



André Gaumont, President and CEO,
Virginia Mines

a strong past and present link to the industry, youngsters in Montréal, Québec's largest city, may know surprisingly little about mining.

"There is a fundamental misunderstanding that develops when people live in the cities. A BlackBerry has about 30 different minerals and anti-mining protestors use these. I don't know what they would do without them; we would all have to go back to carrier pigeons. And even carrier pigeons need to be fed wheat, to grow which you need fertilizer, made of potash, which is mined. If you don't grow it, you mine it; it is a very simple axiom of life. It is a failure of the industry that we have not properly maintained the educational function of where we fit into society," said the President of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), Chris Twigge-Molecey.

The lack of positive information from the sector has allowed negative perceptions to survive as stereotypes through generations. "72% of the public responded to Minaliance's survey in favor of the mining sector. Having said that, the NGOs still raise the issue of old abandoned sites from 50-60 years ago when there was no environmental regulation," said André Gaumont, President and CEO of Virginia Mines, the company that discovered the large Éléonore gold deposit.

Gaumont and Champigny were among the promoters of a successful industry initiative called the Restor-Action Nunavik Fund, whereby a partnership between the provincial government, the First Nations and 30 mining companies and institutions put together C\$6 million to clean up old, abandoned exploration sites in the northern area of Nunavik.

"The mining industry today is totally different; we are actually leaders in terms of environmental care and the largest employer of First Nations," said Gaumont.

Unveiling the North's potential: the Plan Nord

In May, Québec's Premier Jean Charest disclosed the details of the ambitious 'Plan Nord'; a program of expected investments worth C\$80 billion over a 25-year period. The aim is to develop an area of 1.2 million km² into a haven for investment in mining, infrastructure and renewable energy. The first two would account for C\$33 billion of the total amount, with 11 mining projects in the pipeline.

"The north makes up two thirds of the province and is being slow in development. The whole northern part was only handed over to Québec's provincial authorities in 1912. It only began attracting attention in the 1950s with the development of Hydro Québec and some forestry operations. It is a new world and a lot of work needs to be done there," said Raymond Savoie, former delegate minister of Mines of Québec and chairman and CEO of Ditem Explorations, a junior company.

While skeptics in the industry may see the Plan Nord as a marketing campaign at a moment where the government is increasing mining duties and tightening up the regulations, it cannot be denied that facilitating the development of the north will ultimately have a positive economic impact. "It is like the saying, 'if you build it, they will come.' If they put in new roads and railways then we cannot help but access new opportunities," said Rob Metka, Hatch's managing director in Québec.

Grant Arnold, President and COO of Canadian Royalties, a Chinese-owned nickel player said: "The economic engine that drives most of the province, outside of Greater Montréal and Québec City, is all resource-related. I firmly believe the government is on the right track identifying mining as one of the main drivers of employment in certain regions."

One of the main aspects of the Plan Nord is that it enters the area of influence of the First Nations. The idea is to partner with these communities to promote employment and economic growth in areas where very little activities can be developed due to the extreme weather conditions. Allen Palmiere, CEO of Adriana Resources, a company advancing a massive iron ore exploration project in the north, gave his perception on the situation of the Inuit people. "They are not connected to the power grid. Everything has to be brought in by freighter during the summer window, therefore living costs are extremely expensive. The entire population of the area of Nunavik is only 40,000 people so there is not an economic justification



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Rob Metka, managing director Québec, Hatch

for providing the infrastructure. Our major project could act as a catalyst for the economic development of northern Québec.”

The fact that mining projects have a multiplying effect on the local economy through job creation should not overshadow the fact that the First Nations may have particular demands and conditions that they will bring to the negotiation table. Québec already has significant precedents of accords with the aboriginal people, notably the Paix des Braves (‘Peace of the Brave’) signed between the Cree Nation and the Québec government in 2002, which included the creation of the Cree Mineral Exploration Board. More recent developments include the agreement between Consolidated Thompson and the Innu people in the area of the Bloom Lake iron ore mine, and earlier this year the agreement between Goldcorp and the Cree for the development of the Éléonore gold project.

Jean M. Gagné, partner at Fasken Martineau, is the lawyer who advised Goldcorp during the negotiations. He explained that although this agreement is an important milestone for the industry, a lot remains to be done in the province. “The Cree wish to be more involved from a technical perspective and also want, going forward, to meet more of the human resources requirement of projects. The agreement will definitely be a facilitating element for other promoters to operate not only in the region involved, but also the whole province. The James Bay territory is now better known, with a certain degree of stability. Other areas of the province are still concerned by the process of treaty negotiations with First Nations, which may lead to some uncertainty on the kind of deals you may be able to agree to,” he said.

Who wants to be a miner?

Dan Tolgyesi, President of the Québec Mining Association (AMQ), provided some figures about the demographics of the province. “Québec has 1.6 million km², which is more than twice the size of France. However, in France you have more than 60 million people and in Québec we are only 8 million, plus the population is ageing.”

The expansion of the mining sector in the province is raising the question about how to enlarge the pool of talent to work for the mining industry. This is proving a challenge worldwide, not least because the mining industry is chronically cyclical. “The Canadian mining industry will be 100,000 people short over the next five years. The



Renaud Adams, senior vice president of operations Americas, Iamgold

baby-boomers are beginning to retire and the next generation is smaller. The really irritating thing is that three years ago, with the crisis, many people were made redundant and now they do not want to be back to the mining business,” said Twigge-Molecey.

Rob Metka of Hatch agreed. “There is nothing more wasteful than losing people for the wrong reasons. There is an enormous amount of talent in Quebec, and our challenge will be having higher ratios of younger people on our team. In 2011, the only thing likely to go down in our business is the average age.”

The sector is already seeing the arrival of numerous foreigners, mainly from the French-speaking nations in Europe and Africa. Geologists from France, Belgium and Morocco, among other origins, can already be seen working in the Abitibi. Yet the industry needs a wider campaign to attract more people, and not exclusively those who have a background directly linked to mining. “People see mining as a pretty mundane activity in not-so-sexy locations. Unfortunately, we tend to target a narrow part of the population and we should attract a wider range of people from different backgrounds. The first step towards diversity is getting the male/female balance right, but that is just the first aspect. I would like to see a boardroom that looks like the United Nations,” said Cluny Randall, President of Urica Mining Services in Canada and the U.S.

According to Tolgyesi, the sector needs to target three types of people: “women, First Nations and foreign workers.”

Daniel Dumas, CEO of Dumas Contracting, a firm based in Toronto and active across the Americas and Africa, described the current recruitment challenge. “Statistically, if we train 20 employees, only six will possess the initial potential for us to keep on board. Out of these six, one will quit. Of the remaining five, one will become a min-



The Éléonore mine is expected to open up a whole new camp. (Photo courtesy of Goldcorp)

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er after two or three years of training, and the other four will become service personnel. That's how intensive and challenging it is. Everybody is competing for the same workforce and the pay scales are increasing almost by the month."

With this challenge to train new people, and with competition from other parts of the world (industry leaders interviewed for this report mentioned the arrival of head-hunters offering great salary offers to work in Australia), there is no wonder mining companies are increasingly looking at new ways to operate their mines with less people. "Going forward, we will have to be very aggressive in technology to improve efficiency. In Westwood, we are following this strategy," said Renaud Adams, senior vice president of operations for Iamgold, a gold producer that also operates Québec's only niobium mine, Niobec.

Finally, the industry will also have to challenge the perception that mining is a risky activity. "In Canada, mining is one of the safest professions to encourage your children to go into. In Ontario in particular, the only profession that is safer is teaching. Mining is safer than transportation, construction and even retail, which sounds incredible but it is true," said Twigge-Molecey.



Agnico-Eagle Mines is a significant gold producer in Québec. (Photo courtesy of Agnico-Eagle)

Industry statistics show a significant improvement of the safety record in Québec. The combined accident frequency rate (lost time and modified work assignments) in the sector has dropped by 75% over the last 20 years according to the

AMQ; since 2004 in particular, it has decreased every single year.

Unfortunately, the sector, as elsewhere in the world, is not fatality-free: there were three in 2010, leaving an average for the last 10 years of 1.7 fatalities per year in Québec. The total number of people employed in mining in 2010 was 15,100, so the ratio is significantly better than in other countries, but obviously there is nothing that cannot be improved further when the goal is zero.

Laying the future foundations

Providing the recruitment challenge is tackled in an appropriate manner, the future of Québec's mining industry looks assured, for the province has tremendous geological potential. Even the Abitibi corridor, a prolific gold-producing area around the towns of Val-d'Or and Rouyn-Noranda, continues to receive significant exploration expenditures. These mines are deep and the orebodies remain open at depth. With today's high gold prices, miners are willing to risk the investment to pursue deeper reserves. High gold prices also make low-grade gold deposits, located closer to the surface amenable to bulk-tonnage, open-pit operations like Osisko's Canadian Malartic.

Elsewhere, the James Bay area appears to be the potential next mining camp, with Éléonore and significant projects in other commodities acting as a catalyst; not forgetting the vast iron ore potential predominantly found in the Labrador Trough, which has so far only partially been exploited.

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Gino Roger, President and CEO of Midland Exploration, described Québec's exploration attractiveness. "There have been recent good discoveries like Canadian Marlartic and Éléonore in gold, the Matagami zinc deposits, the Raglan nickel deposits and the Strange Lake rare earths deposit. Infrastructure is very well developed and the Québec Plan Nord will be a great boost. There are very good tax incentives and exploration costs are highly competitive in Québec, with very good drillers at low costs. You have everything you need to do exploration work. The Québec government has an excellent database of geological information."

For David Patterson, chairman of Donner Metals, a company working together with Xstrata in zinc and copper, "Québec was built on forestry and mining, and it is a great place to do exploration. For every dollar we spend, we get 40 cents back from the Québec government. It is a unique place. In some jurisdictions governments are trying to stop you from working there, whereas in Québec, they are trying to help you."

That the Québec government is trying to boost its revenues from mining and tightening up the environmental regulations should not obscure the fact that authorities have clearly identified mining's value for the province.

"The government recognizes mining to be an important contributor to growth. They want to develop the north in collaboration with the First Nations and the various communities located therein. Their vision is to use mining as a vehicle, so government support starts right there. In addition, they have a good investment mechanism and tax incentives for exploration companies," said George Burns, senior vice president, Canada and USA operations, Goldcorp.

The availability of clean power at competitive costs from government-owned Hydro-Québec is also a significant positive added to the final equation. "Government support is significant in Québec at all levels. They look at three things: sustainable development, job creation and low environmental impact. We provide all of these, so we are getting lots of support. Besides, infrastructure is good and in Val d'Or there is a history of mining, so communities support us strongly as well. Power costs are the best in the world. It is hard to find a negative in Québec," said Peter Secker, President and CEO of Canada Lithium, a company advancing a spodumene-based lithium project.

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“Ours is a Long-term Vision”

Delegate Minister of Natural Resources Serge Simard defends the regulatory changes being criticized by the sector.

What are the latest initiatives of the Québec government with regards to mining?

We are working to put together a new mining law, that will have to fulfill three main objectives: to create wealth for the whole of the province of Québec; to ensure mining development will be respectful of the environment; and to promote good relationships between the mining industry and the local communities.

The rules are going to change in a significant manner because our citizens are asking for it. However, investors must also be respected, considering the mining industry is a risky business. Mining development must be achieved in a framework of clarity and transparency.

What are the most significant upcoming changes?

The current law was last modified in the 1990s and it needs to be adapted to the new industry scenario and to the new demands from the Québec citizens. For years the Government of Québec has had to deal with the remediation of many ‘orphan sites’ at a cost of C\$264 million from taxpayers’ money. It is only recently the concept of sustainable development has become prominent.

Our new legislative project includes the obligation for mining companies to provide financial deposits amounting to 100% of the costs of site remediation within three years of the issuance of the mining permit. Also, with the new regime, all mining projects processing more than 3,000 mt/d will have to go through a public consultation process.

Finally, it has been proposed that the land within an urban perimeter, as well as the territory of holiday areas and resorts, as defined in the Law of Urban Planning (*Loi sur l'aménagement et l'urbanisme*), will be free of mining activities.

After ranking as the world's most attractive destination for three years, Québec has slipped to fourth position in the Fraser Institute survey. What reasons do you see for this?

Québec is an important destination for investors, as seen in the Québec Exploration conference (a major international show).



Serge Simard, Delegate Minister of Natural Resources

Every year, the administration spends between C\$10 and C\$12 million to collect geo-scientific data all along the territory. In 2010 alone, there were expenditures worth C\$500 million in Québec, thanks to the existence of highly valuable geological databases in the province. Last year, the government approved an increase of mining royalties and this is one of the reasons why we have been toppled at the top position of the Fraser Institute Survey. From 12% we are progressively increasing them to 16% as per January 2012.

We have also revised the tax credits to increase the revenue of the province. Starting in 2014, any money received in mining royalties after the first \$200 million will be placed in a fund to rapidly reduce Québec's debt. We are also considering the possibility of creating a diversification fund to promote development in other sectors. Future generations will need other sources of revenue when mining stops being a primary sector.

Will the government support new investments with the much-needed infrastructure in the north?

The Plan Nord is contemplating total investments of C\$80 billion, to promote roads, ports, aerodromes and power facilities. Furthermore, the government will contribute C\$500 million over the next five years to participate in projects. With the support of Investissement Québec, it will negotiate its stakes to reach maximum profitability for Québec's population. More specifically in mining, there are many projects in the medium term, from companies like Arce-

lorMittal, New Millennium, Cliffs, Goldcorp and others, for a total investment of C\$10 billion. Thousands of jobs are going to be created as a result.

On top of having rich natural resources, the province is also known for its good industrial base. How can Québec move along the value chain to create integrated industries for minerals such as lithium?

To take the example of lithium, the government has an investment program of C\$250 million to adopt electric vehicles. The province has important lithium deposits and there is also a company who manufactures lithium batteries in Québec, 80% of which are exported. Furthermore, what makes this even more interesting is that we have a great advantage due to Hydro Québec producing mainly from hydro sources. We have fantastic access to clean energy at competitive prices. Putting together all of these factors we could develop a whole sector based on new technologies and clean energy.

How can the industry overcome the shortage of skilled professionals as the demand for people continues to increase?

We are actively working with the different universities to match the needs of the companies with training programs, while we also need to find specialists from overseas. Québec's population is getting older, so immigration will be important to maintain economic growth. We are providing tax incentives for people that stay at work beyond the age of 65; and we are also promoting the integration of women in the labor market.

Do you have any final messages for the readers of E&MJ?

The advantage that Québec can offer is that here projects must promote sustainable development. Producers in Québec will have a product that is more valuable thanks to this; they will be able to assure buyers that their products, such as diamonds or tantalum, are extracted in a responsible manner. All this will be done within a very clear regulatory framework to guarantee mining investors that the money they will invest will not be at risk. Ours is a long-term vision for the future of the mining industry and the best interests of Québec.

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Gold Production in Québec

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Casa Berardi, an old site shut down in the 1990s, was back into operation in 2006. (Photo courtesy of Aurizon Mines)

Québec continues to benefit from the prolific Abitibi gold camp, a traditional mining area that has historically produced more than 180 million oz of gold between the Ontario and the Québec sides. The heart of this area is the town of Val-d'Or (Golden Valley), a six-hour drive northwest of Montréal. The area, which was seen as being mature when the price of gold was low, has gained new preeminence as prices reach \$1,800 per oz, unlocking value in old underground mining deposits as well as new, previously unexplored, open-pit potential. 2011 has seen the commercial startup of Osisko's Canadian Malartic operation, which is substantially increasing Québec's gold production figures of 810,000 oz/y in 2010, providing an additional 359,000 oz/y this year and 662,000 oz/y in 2012 (its first full year of commercial production).

Montréal-based Osisko has achieved impressive success at a very fast pace. Its first drill-hole as a very junior company was in March 2005 and, since then, a number of bold moves, including resettling an entire town, ordering the equipment without having permits and raising hundreds of millions of dollars in the middle of the global financial crisis in 2009 have created Québec's largest gold mine in a record period of time.

"When we started exploring at Canadian Malartic, our major concern was that you could throw a rock from the drill to the first house. We knew the relocation of the town was going to be a crucial point. In the fall of 2007 we made a proposal to buy houses for a 25% premium and move the people to a new neighborhood. That was a big risk for us, because we did not have a production decision, nor a feasibility study, an EIA or

a mining permit. When I told my board of directors that we were going to spend C\$80 million without having a feasibility study, it was not a very smooth meeting," said Sean Roosen, President and CEO of Osisko.

Osisko managed to go from the feasibility study to permits in 9.5 months. "In 2009, we were just coming out of the crisis and there was political goodwill to get things rolling and to create jobs, so we had a tail wind pushing us. We built this mine in 18 months from start to finish," Roosen said.

Canadian Malartic is a C\$1 billion open-pit operation, processing 60,000 mt/d with an average grade of 0.97 g/mt. Average annual production for the life of the mine will be 574,000 oz/y, although the first five full years between 2012 and 2016 will yield an average of 625,000 oz/y. Cash costs are US\$319/oz.

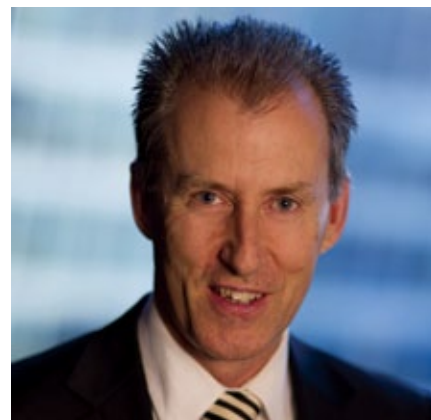
Canadian Malartic's resource of 10.63 million oz (measured and indicated) at a cut-off grade of 0.3 g/mt was built through 636,000m of drilling since 2005. It is what Mr Roosen ironically calls the SUDS strategy or 'shut up and drill, stupid', which applies to the company's aggressive exploration efforts. "We drilled 410,000 m company-wide last year, which is more than what Barrick drilled," he said.

The company has had 23 rigs operating this year; exploration projects in the Abitibi have included four zones around Canadian Malartic as well as a number of joint ventures, including the agreement with Clifton Star Resources for the drilling of 129,000 m at the Duparquet area. The intense focus on exploration is without prejudice to M&A opportunities, crystallized last year when Osisko acquired Brett Resources and got

hold of the Hammond Reef project in Ontario, which is expected to start production in 2015, a moment where the company would be producing nearly 1 million oz/y of gold in total.

A mine that will yield similar production figures annually to Canadian Malartic is Éléonore, a \$1.4 billion investment already approved by Vancouver-based Goldcorp, and which should be into production by late 2014. The mine will process 7,000 mt per day to produce 600,000 ounces of gold annually over a 15-year mine life, at cash costs of less than \$400/oz. If everything goes well, Éléonore will play an important role for the company to reach its target of 4 million oz of gold production by 2015.

Éléonore is located in the James Bay, a new mining area in Québec. "What is exciting about Éléonore is that it is in a completely new jurisdiction, so we believe we have a first-mover advantage there. Production-wise, we believe that we are on the edge of a district, so the potential around



Steve Reid, executive VP and COO, Goldcorp

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Éléonore is huge,” said Steve Reid, executive vice president and COO of Goldcorp.

George Burns, senior vice president of operations in Canada and the U.S., Goldcorp, discussed the deposit’s potential. “The exploration shaft allows us to do the detailed drilling on the top part of the ore body, but also to drill the bottom efficiently, from 650 m down to 1,400 m where the ore body is still open. Our approach is that this is a big ore body for a big mine. Size will be key to bring costs down,” he said.

For the project to go ahead, an agreement with the First Nations was signed earlier this year, specifically with the Cree Nation of Wemindji and the Grand Council of the Crees. Reid underlined that it is “a collaboration agreement, not an impact agreement. It is a very progressive, forward-looking approach.”

Burns affirmed it is important to empower the Cree to take responsible positions as employees of the mine. “We are going to have more than 1,000 employees during the construction peak and 600 employees during the operations. We have not set any quotas for Cree participation or employment, but we are investing in proactive training and education programs in the front end. We do not want Cree people just in labor jobs but also in leadership positions.”

The Abitibi’s medium-sized mines

Although the emergence of Osisko will change the ranking of gold producers from 2012, in 2011 Québec’s largest gold player is still Agnico-Eagle Mines, a company headquartered in Toronto that operates six mines in total: three in Québec, one in Nunavut, one in Mexico and one in Finland, for a total estimated production of 1.17 million oz/y of gold last year, which is a 19% increase year-on-year; 466,000 oz of which is from Québec.

The company’s flagship mine in Québec is LaRonde. One of the deepest underground mines in the Americas going down nearly 3,000 m, and the one with the deepest single-lift shaft at more than 2,200 m, it has been in operation since the 1980s. Thanks to its silver and base metals credits, the mine offers exceptionally low cash costs of US\$54/oz in 2011.

A major expansion is now underway, with a C\$246 million investment to develop the deposit at depth, where the high temperatures of the mine require significant cooling. While production estimates at LaRonde are 157,000 oz/y in 2011, the mine should produce 290,000 oz/y of gold between 2012 and 2015 at cash costs of US\$381/oz. “We have more than 1,000



Paul-Henri Girard, VP Canada, Agnico-Eagle Mines

employees at LaRonde. Our current proven and probable reserves there are 35 million mt with a grade of 4.3 g/mt gold (thus 4.8 million oz), plus 24 g/mt silver, 0.28% copper, 0.90% zinc and 0.07% lead. The estimated mine life goes until 2023,” said Paul-Henri Girard, vice president Canada, Agnico-Eagle Mines.

The other two mines in Québec, both underground operations in the Abitibi region, are Goldex (estimated production in 2011 was 184,000 oz/y before the operation had to be suspended last month due to water inflow and ground stability issues) and the high-grade Lapa (125,000 oz/y). According to Girard, expanding in the Abitibi was not a difficult task. “It is easier to develop mines here than in Nunavut, Africa and South America. In our case, we built up Goldex and Lapa using people from the LaRonde mine. It was pretty straightforward,” he said. He hopes the upcoming changes in regulations will not worsen Québec’s position worldwide. “If you increase mining royalties it is likely that companies will invest less in exploration. International players constantly analyze where the best jurisdictions are to find and develop mines. Quebec has fallen from being the top province to invest in Canada, but mining companies still believe that it is still a great location to mine when you look at the global picture and so do we.”

Another company with a long-standing presence in the Abitibi is Iamgold, through its Doyon division, who are currently in a transition point since the closure of the Doyon mine in 2009. The Mouska mine, part of the same division, remains active with a low output (33,000 oz/y in 2010), however the current focus is the Westwood project, a new underground gold operation. The project has 269,000 oz Au (indicated) and 3.46 million oz (inferred). Expected production over the life of the mine will be 186,000 oz/y, starting with 140,000-150,000 oz/y in 2013.



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The Abitibi hosts a number of small and medium-sized mines. (Photo: Beaufor mine, courtesy of Richmond Mines)

“The Westwood development project in Quebec reflects our commitment to continue working in the province. We have more than 20 years of experience in that area and it is a great place to do business. Westwood is an investment in the range of C\$500 million. We are also working very hard to extend production from Mouska, so that we could have 200,000 oz/y altogether,” said Renaud Adams, senior vice president of operations in the Americas, Iamgold.

2011's development budget at Westwood is C\$146 million, which includes sinking the shaft to 1,560 m (planned depth is 2,000 m, extendable to 2,600 m); 82,000 m of in-fill and step-out drilling, and 13,000 m of underground development.

Iamgold, a company with production of more than 1 million oz/y of gold worldwide (it has mines and interests in Africa and South America), also produces niobium in Québec (see separate article on Strategic Minerals). Adams, who noted Iamgold received the Environmental and Corporate Social Responsibility Award from the PDAC earlier this year, pointed at low production costs and high health and safety standards as important values for the company. “There are many ways to add value, not just adding gold ounces to the production portfolio. In Mouska, we have recently celebrated two years without lost-time accidents. Mining underground is challenging, but we have achieved very high standards in all our operations. Until we reach a zero-accident rate we will not be happy.”

Without leaving the Abitibi region, Aurizon Mines is another player that is building up its production portfolio in the area. The company operates the Casa Berardi site, a

former mine shut down in the 1990s that it returned to production in 2006, and whose output in 2010 was 165,000 oz/y of gold at US\$525/oz, processing 2,000 mt/d. Back in 2006 there were reserves for five years, however by the end of 2010 mine-life had been extended until 2020 through exploration. Besides, the plant has capacity for 2,400 mt/d and the idea is to feed the mill to reach full capacity over the next 18 months.

Martin Bergeron, vice president operations of Aurizon Mines described a scenario of increasing costs in a competitive environment. “There is strong pressure on costs due to the shortage of people in the market and higher prices of raw materials such as diesel and steel. The strong Canadian dollar has also had an impact.”

The company's objective is to reach 500,000 oz of gold production in five years and to achieve that it is evaluating M&A opportunities as well as engaging actively in exploration both on its own and with a number of joint ventures with junior companies. The most advanced of its 100%-owned projects is Joanna, an open-pit project where the pre-feasibility study considered production of 110,000 oz/y of gold over 8.5 years; however since then the resources have significantly increased and the upcoming feasibility study should include higher figures.

“An important aspect about Joanna is that part of the ore is refractory. With the use of an IsaMill, that grinds the material to a level of five to eight microns, together with Albion oxidation, we could increase recovery. For the feasibility study we have done tests with 300 kg samples, which have given a final recovery rate of 85.1%. Besides, there is a need for an increasing level of reactive agents like cyanide, acid, oxygen and lime. We continue the tests to ensure that we can optimize the process,” said Bergeron.

Other producers in the Abitibi area include Century Mining, operators of the Lamaque underground mine which is being ramped up to reach more than 1 million 100,000 oz/y of gold production in 2013 (guidance for 2011 is 70,000-75,000 oz/y); as well as North American Palladium, a palladium player in Ontario that is growing a newly-created gold division in Québec; not to forget Richmond Mines, Wesdome Gold Mines and Alexis Minerals.

North American Palladium, which operates the Lac des Iles mine in Ontario (one of the only two primary palladium mines in the world), acquired the Sleeping Giant gold mine in the Abitibi in 2009, with a strategy to achieve scale through organic growth in gold production. While 2011 is a year of

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transition at Sleeping Giant, with production of 15,000-20,000 oz/y, 2012 should be a different story. "When we acquired Sleeping Giant, we did so knowing the future of the mine is at depth. During Q2 we completed a 200 m shaft deepening to gain access to three new mining levels of higher-grade ore that should be developed by the end of the year. For the start of 2012, we expect increased production and lower cash costs per ounce," said Bill Biggar, President and CEO, North American Palladium.

On the other hand, the company has the leverage to expand its Sleeping Giant mill from 900 mt/d to 1,250 mt/d or 1,750 mt/d. Being the only mill in a 100 km radius, it is expected to receive ore from NAP's other wholly-owned projects within trucking distance. The most advanced of which is Vezza, where the company is investing C\$32 million this year. A positive production decision could be reached before the year end, and production of 39,000 oz/y gold over a nine year mine life could start in early 2012. After this, the next mines in the pipeline would be Flordin and Discovery; the idea is to reach over 100,000 oz/y gold combining the Abitibi assets.

The gold division being relatively new, and the palladium price performing very well (it increased by 70% in 2010), Biggar believed investors are not attributing much value to NAP's gold assets in the Abitibi. "The market has not yet recognized the value of NAP's gold division. Our market cap is mostly attributed to our palladium operations," he said. Exploration-wise, the company is spending C\$9.1 million on the gold side this year.

A long-standing player in the Abitibi is Richmond Mines, a company that went

public in 1984 and that currently has two mines in production; Long Island in Ontario (46,000 oz/y gold in 2010) and Beaufor in Québec (22,200 oz/y). A third one, the old Francoeur mine in Québec, will be put into production again in 2012 for an output of 35,000 oz/y to surpass the barrier of 100,000 oz/y company-wide. The objective is 200,000 oz/y. "To reach our goal we are considering a variety of options, including buying non-core assets from larger producers, examining project synergies with our peers and looking at exploration companies to whom we could bring value and bring their projects into production," said Martin Rivard, President and CEO of Richmond.

On the organic growth front, Richmond has the Wasamac property, also a past producer, with 43-101 resources of 411,000 oz gold (measured plus indicated) and more than 1 million oz Au (inferred), across four zones, as per December 2010. Since then, the company has been undertaking a 2011 drilling campaign of 45,000 m at Wasamac. "Our plan is to evaluate the potential of Wasamac for an underground bulk mining operation. This year we plan to expand our confirmed resources and increase our level of confidence to complete a scoping study. It has the potential to be a significant driver of Richmond's growth going forward," Rivard said.

The interest in former gold mines that are now back in business due to better gold prices is replicated at Wesdome Gold Mines, a company that has been active in Québec over two decades. While it has another operation in Ontario, its main asset in Québec is the Kiena mine, a site that was brought back into production in 2006 and yielded 32,000 oz/y gold in 2010. The mine has reserves of 99,000 oz gold plus additional 170,000 oz Au in resources, figures that the company expects to improve after 104,000m of drilling in 2011 aimed at exploration and definition/delineation.

Very close to Kiena (where earlier this year the company completed one million man hours without any lost-time incident), Wesdome has recently discovered a new high-grade area called Dubuisson. "At Kiena we are currently processing about 1,000 mt/d, which is half of the plant's capacity. If the Dubuisson zone turns out well, we would probably be adding 200-300 extra mt with high grades, which would have a very significant impact upon our production rates with minimal capital required," said George Mannard, vice president exploration at Wesdome.

Mannard underlined the challenges of increased competition as high gold prices

attract new and aggressive players. "The environment for acquisitions is very expensive. Therefore, our objective is to focus on internal growth with the properties we have."

With regard to the workforce shortages, he added: "Competitiveness has got to the point of unethical behavior by head-hunters. This industry is cannibalizing its own resources. At the end of the day, it is the market dynamics of supply and demand, but you rarely see wages going down, therefore the economic feasibility of individual projects could be affected."

Also mining gold in the region is Alexis Minerals, a company that has restructured during 2011 as a result of financial and operational difficulties at its Lac Herbin mine in Québec, where production will decrease this year to between 9,000 and 11,000 oz/y of gold. New management, led by President and CEO François Perron, announced a turnaround plan for the mine that intends to return it to profitability levels next year, with production ranging between 15,000 and 20,000 oz/y.

The list of gold producers in the Abitibi should soon incorporate Blue Note Mining, who is advancing its Croinor project, where it expects to extract 170,500 ounces of gold over a five-year period that includes 14 months of pre-production, according to pre-feasibility data updated in June. "Within pre-production we have four months of de-watering and another month for surface installation, but once we have that in place we will get rolling," said Léon Méthot, chairman, President and CEO of Blue Note.

Including the initial capex of C\$25 million and the operating costs, the total expenditure per ounce will be US\$768. "We are pretty much in the same cost quartile as our peers. Underground mining from veins is expensive but at current gold prices it makes a lot of sense to do it. I expect to see consolidation in the market, to get better economics in the different projects and also because there is a shortage of people to put these projects into production. Luckily, in Val-d'Or there is a strong history of this type of mining," said Méthot.

Favorable gold conditions have raised the Abitibi's profile as Québec's mining sweet spot. Notwithstanding the amount of gold that has already been extracted, the area has still lots to offer both in deep deposits and shallow lower grade opportunities, as Osisko has shown at Canadian Malartic. At the same time, the James Bay emerges as a promising area for the medium term. Gold investors will certainly keep a close eye on Québec's developments in the years to come.



Most of the Abitibi's gold mines are underground operations. (Photo: Sleeping Giant mine, courtesy of North American Palladium)



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Base Metals

Mines and advanced projects



Xstrata is expanding its Raglan operation in Northern Québec. (Photo courtesy of Xstrata Nickel)

Although gold tends to attract the most attention from investors, the production of base metals in Quebec is no less significant. There are a number of companies active, but Xstrata is arguably the main player through its Xstrata Nickel and Xstrata Zinc divisions. With regard to nickel, the company operates the Raglan mine on Québec's far northern shore. The site consists of three underground mines, while a fourth one called Kikialik will reach commercial production status next year. Milling capacity is 3,900 mt/d. In 2010, the operation produced 28,236 mt/y of nickel, 7,134 mt/y of copper and 567 mt/y of cobalt, all in concentrate.

Xstrata's US\$530 million Raglan extension project includes an upgrade in the concentrator to reach 40,000 mt annual capacity of nickel concentrate by 2016. The mine has been producing since 1997 and, being located in the Nunavik region, it has a profit-sharing agreement in place with the Inuit population (earlier this year, C\$15.2 million were paid by Xstrata, as per 2010's profits at Raglan). As of June 2010, the mine had mineral reserves of 5.32 million mt at 2.11% Ni and 0.61% Cu (proven) and 6.26 million mt at 3.50% Ni and 0.86% Cu (probable). Furthermore, there are 31 million mt of ore in resources across the different categories.

The area of Nunavik should see a second mine soon; the Nunavik nickel mine. It was discovered by junior company Canadian Royalties, today owned by Jien Canada Mining, a joint venture controlled by China's Jilin Jien Nickel Industry, with participation from Vancouver-based Goldbrook Ventures. President and COO of Ca-

nadian Royalties, Grant Arnold, explained the project involves a 4,500 mt/d processing facility with multiple nickel, copper and platinum deposits in a similar fashion to Xstrata's Raglan operation.

In spite of legal disputes between Goldbrook Ventures and its Chinese partners, the mine is expected to be up and running during 2012. Due to its location, the operation presents a number of challenges, explained Grant Arnold.

"Nunavik Nickel is a logistically driven project with arctic-like conditions. We require our own port facility. We currently have an airport sharing arrangement with Xstrata; it is fly-in, fly-out. Our shipping season is the same as Xstrata's; there are shipping blackout periods that we have to work around, but they are not consequential," he said.

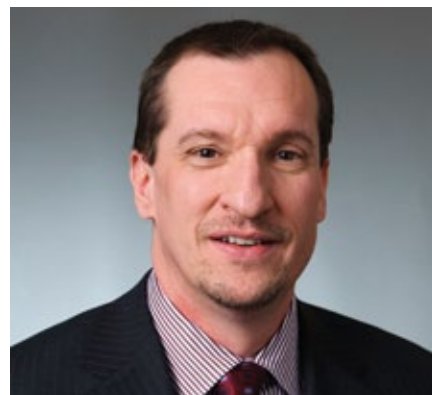
Current mine life is around 10 years, but the company is confident that it will be expanded. "We have an excellent discovery record and the belt is considered to have a low level of exploration maturity," said Arnold. Like Xstrata, Jien Canada has an impacts and benefits agreement (IBA) with the Inuit communities, which provides the framework for contracts awarded with Inuit-associated firms.

Arnold is similarly confident about nickel fundamentals. "I am optimistic that we should be into a period of sustained demand. There are a number of laterite nickel projects that are not yet up and running, and which will supply much of the nickel consumed by the stainless steel industry, but this will be balanced by production declines from other deposits and increased demand," he said.

Another project in the nickel spectrum is Royal Nickel's Dumont sulphide project. Although it is still at the exploration phase, the company has put in place a nickel development team with a number of directors and officers formerly at Vale Inco. Dumont, located in the Abitibi region, has a 43-101 compliant resource of 7 billion lb of nickel (measured + indicated) and a further 3.2 billion lb (inferred).

The company has just published the results of its pre-feasibility study for the project, which considers an initial capex of \$1.1 billion for a 50,000 mt/d operation, expandable by year 5 to 100,000 mt/d with a \$700 million investment. Annual production would be 44,000 mt/y of nickel during the 19-year mine life, plus 27,000 mt/y for the subsequent 12 years from processing the lower grade stockpile. Cash costs would be \$4.13 per pound.

Like Arnold of Canadian Royalties, Royal Nickel's President and CEO, Tyler Mitchelson is very optimistic about the future of



Tyler Mitchelson, President and CEO, Royal Nickel Corp.

nickel. "Demand has not dried up. China continues to be a huge driver and stainless steel consumption keeps increasing. On the supply side, projects that started in 2006-07 were located in challenging jurisdictions like New Caledonia, Madagascar and Papua New Guinea. Many high pressure acid leach laterite projects were meant to have costs of just over a US\$1/lb are now looking at around US\$4/lb. The economics of these projects have changed completely and nobody wants to build them. We are seeing companies either divesting or delaying the development of these sorts of assets, so there is going to be a supply deficit."

Mitchelson was also convinced that following the wave of acquisitions by foreign players over the last years, there is a niche for Canadian companies like Royal Nickel. "There are currently no base metal companies in the medium-size range on the TSX. Investors are hungry for companies the size of what Alcan, Falconbridge or Inco used to be," he said.

Zinc and copper

Québec's largest producer of zinc is again Xstrata, through Xstrata Zinc, which operates the zinc and copper Perseverance mine in Matagami. Additionally, down the value chain the company also has the CeZinc refinery in Valleyfield close to Montréal (treating 500,000 mt/y of zinc concentrate), and the General Smelting Company of Canada which processes zinc as well as lead and tin. On the copper side, Xstrata Copper operates the Horne Smelter in Rouyn-Noranda with an annual production capacity of 200,000 mt of copper anode and 600,000 mt/y of sulphuric acid; and the Canadian Copper Refinery in Montréal, that produces copper cathode, gold and silver.

The Perseverance mine extracted 1.06 million mt of ore with grades of 14.09% zinc and 1.08% copper in 2010. "These grades, combined with the current zinc and copper prices, make these operations very profitable. At Perseverance we have three relatively small ore bodies, of about 1 million mt each, plus a small satellite deposit. It has zinc, copper, silver and gold. We do not have significant low-grade areas, therefore it will be exhausted in early 2013," said Jean Desrosiers, vice president of mining operations at Xstrata Zinc.

The company has already secured more zinc and copper production in the area with the development of the Bracemac-McLeod joint venture project with Donner Metals. "Bracemac-McLeod will be a very profitable mine because we do not have to build a new mill and transportation costs will be very low. However, what makes it a great operation is the people that we have at Perseverance. It makes complete sense to make the most of this team for the new mine," Desrosiers said.



Bracemac-McLeod will annually mine 850,000 mt of ore at 10% zinc and 1.5% copper. (Photo courtesy of Donner Metals)



The Elements of Value Creation



Royal Nickel Corporation (TSX: RNX) is focused on value creation through the development of its 100%-owned Dumont Nickel Project, which is one of the largest nickel sulphide projects in the world. The Dumont Project is located in the Abitibi region of Quebec.

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Perseverance will be shut down in Q1 2013 and Bracemac-McLeod will start pretty much at the same time. Expected mine-life is four years, expandable to six years according to Desrosiers.

Through this joint venture agreement, signed with Falconbridge just before it was acquired by Xstrata, Vancouver-based Donner Metals has spent C\$25 million to secure a 50% in five exploration areas in Matagami. In the case of Bracemac-McLeod, Xstrata has earned back an additional 15% to develop the mine, so it is a 65:35 situation. Donner Metals' chairman, David Patterson, described the initial success of the exploration program. "We made the Bracemac discovery with our second drill hole in the area. After the Matagami Lake Mine, which established the camp as a world-class mining district that has been explored for 50 years, we found what is likely the second largest, the Bracemac-McLeod mine. In Canada we say the best place to find a mine is in the shadow of a headframe, so it was an incredible accomplishment to find one so close to an existing mine."

Bracemac-McLeod is expected to extract 850,000 mt of ore annually at grades of 10% zinc and 1.5% copper.

Patterson emphasized the advantages of these high-grade deposits. "In countries like



Azimut Exploration crew drilling the Rex project in Nunavik. (Photo courtesy of Azimut)

Peru you have big porphyry systems with low grade zinc in them. What we have is high grades in defined areas, which are far more valuable. We can go in with our ramp and rehabilitate the site in just a few years, without doing a huge open-pit."

While zinc suffered a serious blow during the financial crisis in 2009, both Desrosiers and Patterson were optimistic about the future of this base metal. "I do not believe zinc will go back to 50 cents/lb again because at 50 cents/lb no operation can be economic today. There will be cycles though; what we see is that there is too much zinc in the

market right now, but at the same time all metals are going up, plus a lot of big mines are shutting down, so after two years the zinc fundamentals should strengthen," said Desrosiers.

"Zinc is used for galvanizing steel, so it is going to continue growing in the future. Big mines in Chile and Peru are running out of zinc and moving into the copper side; Antamina and Collahuasi are good examples. There have been no new large zinc discoveries lately, so the price of zinc will certainly rise," said Patterson.

While Bracemac-McLeod will only come online in 2013, there is another mine that should be producing more zinc in Québec as early as next year. Toronto-based Breakwater Resources, a zinc producer with active mines in British Columbia, Chile and Honduras, is advancing the reopening of the Langlois mine in Québec. At the time of writing, Breakwater has been acquired by a European company, Nyxstar NV.

Before the transaction offer was announced, Breakwater's vice president for Canada, Bertrand Boivin, offered some background information about the Langlois mine. "The mine will be processing 600,000 mt/y for an output of 90,000 mt/y of zinc concentrate and 13,000 mt/y of copper concentrate. Langlois is a difficult mine to exploit because it consists of veins with a width of 3.5 m and they vary a lot from one level to the next, therefore it requires a lot of development work. Copper credits help mitigate high production costs," he said.

Langlois, which is located 230 km north of Val-d'Or, was put into care and maintenance due to the crisis, but the company's plan in 2011 included spending between C\$35 and C\$40 million in development work; a good sign that base metals are back to good economics.

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The Abitibi's Remaining Potential

Exploring for more gold in a prolific area



(Photo courtesy of Alexandria Minerals)

A great geological endowment and excellent incentives in place for exploration companies make Québec one of the favorite destinations for junior companies.

According to the report by the Metals Economics Group for 2010, Québec was the second Canadian destination for exploration, receiving 17% of the country's C\$2.2 billion exploration budget. This is only second to Ontario and does not include expenditures in iron ore, which are significant in Québec.

Most of the gold exploration is concentrated in the Abitibi belt where companies take advantage of the existing access infrastructure, potential synergies with producing mines and drilling costs that go from competitive to exceptionally low. In this context, a number of juniors are building up their 43-101 compliant gold resources, mostly with the idea of attracting the attention of development companies. Juniors with significant resources in the Abitibi include Maudore Minerals, Alexandria Minerals, Niogold and Xmet, amongst others.

Maudore Minerals has 100% ownership of the high-grade Comtois deposit in the Abitibi, which has 1.2 million oz in inferred resources as of February 2010's 43-101 resource calculation. Of these, 504,000 oz are within the first 150 m.

"The grade is the best thing we have. Our potential open-pit has a grade of 3.2 g/mt, which is triple the average grade for open pits in operation. Our 'underground' resource has a grade of 6.8 g/mt. This, combined with being in Québec with very low-cost hydro-power, would make for a very low-cost producing mine," said Ron Shorr, chairman and CEO of Maudore.

The company has been aggressively drilling since the publication of this resource in early 2010. Last year it totaled 82,500 m of drilling.

"Over 80,000 m of drilling are not included in the resource yet. Our drilling is increasing the confidence in the known resources, in the open-pit area in particular, and also expanding the resources at depth and along strike," said COO Kevin Weston.

Ron Shorr insists Comtois' high grade proves the Abitibi area is far from being fully explored. "We are in the north-eastern portion of the Abitibi Greenstone belt and that is not mature at all. We are 75 km from the nearest gold mine. We may be sitting on a massive sulphide gold deposit, similar to Agnico-Eagle's LaRonde. More than half of the massive sulphide gold deposits in the world are in Québec," he said.

Toronto-based Alexandria Minerals Corporation holds 21,000 hectares in the Val-d'Or area and is working mainly on three properties: Orenada, where it has a resource of 447,000 oz gold (M+I) and 302,000 oz (inferred); Sleepy, where there are 150,000 oz of inferred resource; and finally Akasaba.

"The resources we have in hand do not include anything that we have been doing in Akasaba. We envision a substantial increase in the number of ounces when we complete our 20,000 m program. Akasaba is a relatively new story for us, even though it was an old-producing mine back in the 1960s. In terms of geology and mineralization, we see it as other rich volcanic massive sulphide (VMS) targets like Agnico-Eagle's LaRonde, which is a 10 million oz deposit," said Eric Owens, President and CEO of Alexandria Minerals.

Orenada sits within 15 km of four mills, all of which are operating below capacity according to the company. Alexandria's next steps at this property are to complete an economic assessment, to expand the resource and to find a joint venture partner.

"The goal is to move Orenada as close to production as possible by outsourcing the milling component. This would allow us to be ready for production in just 18-24 months, as opposed to constructing our own mill," Owens said. Finally, more drilling at Sleepy, the other property with a defined resource, is also in the company's plans.

Niogold Mining Corp.'s main focus is on the Marban block. Marban holds a 43-101 resource of 598,000 oz Au indicated and 361,000 oz inferred, and two new high-grade zones have been discovered recently in the area. The company, which refers to the Abitibi district as the 'Golden Highway', has a joint venture at Marban with Aurizon Mines, by which the latter can acquire up to 65%; expenditures in the ground for the ini-



Ron Shorr, chairman and CEO, Maudore Minerals

MINING IN QUÉBEC

tial 50% earn-in are C\$20 million in three years. "The Marban Block represents only 14% of our land package. It had past production of 600,000 oz from three shafts. We are fully evaluating the bulk tonnage potential near surface, initially from 0 to 300 m depth and also we are moving deeper and towards the east," said Rock Lefrançois, President and COO of Niogold.

On top of Marban, where Niogold remains the operator until Aurizon completes its 50% earn-in, the company is also drilling 20,000 m in other properties in the area. "This will be Niogold's biggest year for drilling to date. However, we are in that stage between being a junior and a producer where it is difficult to attract attention," said Chairman and CEO Michael Iverson.

In a similar situation to Niogold, as a company in between an explorer and a producer, is Québec City-based Conway Resources, who are working to reopen the old Belleterre mine in the Témiscamingue area. Belleterre produced short of one million oz of gold in between the 1930s and the 50s, most of which came from one single vein. The company is working to proof the economic feasibility of other veins of the property.

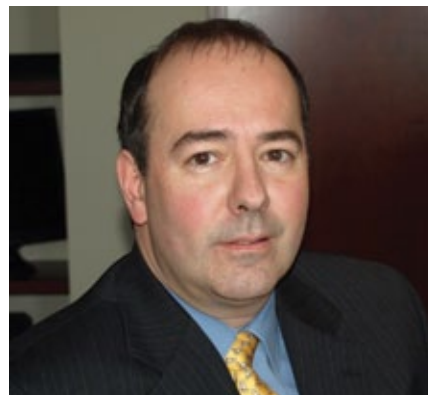
"The historic resource is 175,000 oz (not 43-101 compliant yet); we want to

increase it to 200,000 oz and then restart the mining exploitation. We plan to process 300-400 mt/d," said Laurent Beaudoin, Chairman, Conway Resources.

The company wants to move into production as soon as possible rather than just validate the old resource. "We could spend millions in drilling and still have the same results, so what we are going to do is a ramp to start extracting material as well. We are going to use the thermal fragmentation technology patented by Rocmec, by which we are going to extract just the mineralized zones in the vein. This makes the project more efficient and profitable," said Beaudoin.

Conway plans to use new gold extraction methods. "Over the last years everyone has moved into cyanide-based gold production, but there is another technology by Nichromet Extraction which provides a dry final product, non-polluted. This way we will save between C\$325,000 and C\$1.2 million annually in waste management. We will use the residue in a separate manufacturing plant to produce industrial materials for the construction business mainly, which will be good for job creation."

Beaudoin expects the gold mill to cost C\$45-50 million, and the plan is to be in production in 24 months.



Marco Gagnon, President and CEO, Adventure Gold

Re-thinking the exploration models

According to Agnico-Eagle Mines' vice president for Canada, Paul-Henri Girard, "the increase in metals prices is inciting people to take old projects out of their drawers." Dusting off old projects, however, requires a new exploration approach that will be suitable to the always-changing commodity scenario.

The success of Osisko at Canadian Marlaric is a great example that the Abitibi can hold large deposits with bulk, low-grade ore, exploitable under highly profitable parameters. A number of juniors are following suit and are working with that idea in mind. One of them is Eagle Hill Exploration, owners of the Windfall Lake property, comprising 362 contiguous claims for a land package of 12,000 hectares.

"Prior to our arrival at Windfall Lake, previous operators had already spent C\$25 million on it and drilled over 330 holes, but were unable to put together a solid geological map, even though they were hitting high grades. There was all this information on the property available and we needed to understand how it fit into the geological model," said Bradley Kitchen, President and CEO, Eagle Hill Exploration.

The company analyzed 8,700 m of core that had never been assayed which, according to Kitchen, saved them C\$1.2 million in drilling costs. The results favored the company's hypothesis that Windfall Lake could be a bulk-tonnage scenario. "What we have done is different from most junior resource companies that chase drill-holes to get more funding so they can do more drilling. Between August and December 2010, we spent time better assessing the modeling of the deposit. Since December we have hit gold in all 24 holes we have drilled."

In a similar fashion, Yorbeau Resources of Montréal also decided to sit down and put an exploration twist at their Rouyn property, which covers a 12 km stretch of the Cadil-

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lac-Larder Lake break in the Abitibi belt and is divided into several blocks containing two deposits: Astoria and Augmitto.

"We went into a complete data review and core re-logging program to clarify the geologic and structural setting at Rouyn. There was a large amount of misidentification on the rock by earlier workers because of the high turnover rate. Because of certain characteristics in the geology, they misidentified where certain drill holes should stop, and did not recognize that there is another gold horizon underneath their primary target," said Thomas Robyn, President and CEO of Yorbeau Resources. Yorbeau have recently added 207,000 oz of 43-101 compliant resources at Augmitto (all categories) to the previously existing 249,000 oz (M+I) at Astoria. Other blocks of interest are Cinderella and Lake Gamble, where it has been conducting in-fill and definition drilling this year. Yorbeau also keeps a 2.5% royalty in the Ellison property currently operated by Agnico-Eagle, located close to lamgold's Westwood project. Agnico-Eagle's expenditures at Ellison are C\$4.8 million this year.

Close to the area where Osisko and Clifton Star have been jointly exploring is Xmet Inc., which is working to earn a 75% interest in the Duquesne-Ottoman property owned by Globex Mining Enterprises. The company has been busy with a 13,000 m drilling campaign this year which has resulted in an increase of its 43-101 inferred resources to 727,000 'cut' oz of gold. The aim in the medium term is to increase the resource to 1 million oz and further capitalize the company to exercise the option, said President and COO of Xmet Charles Beaudry.

"We know there is potential for low-grade bulk minable mineralization at Duquesne-Ottoman, which would be potentially of great interest for our neighbors. Great infrastructure and access to labor locally could make for an economic project with a modest resource-base," said Beaudry.

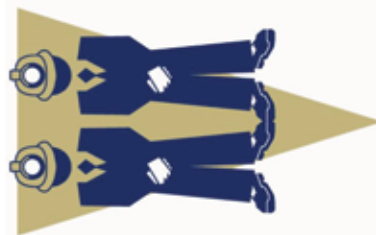
Junior companies and the JV model

Rouyn-Noranda based Visible Gold Mines is also working on the gold front with a 43-101 resource of 164,000 oz at its Stadacona-East property. The company, a spin-off from sister company Fieldex (active in base metals exploration) is spending C\$6.5 million this year on 40,000 m of drilling, all in targets deeper than 500m. Besides Stadacona, the company has Silidor (100% owned) where it is looking for extensions to the past producing Silidor mine; options at the Cadillac and Lucky Break projects; and the Joutel joint venture with Agnico-Eagle Mines.

"Joutel previously produced 1.1 million oz of gold, but the site was closed in the 1990s. We think that there is still 1 million oz left on the property and we have identified targets where we are going to spend C\$5 million by drilling for six months," said Martin Dallaire, President and CEO of Visible Gold Mines.

The partnership situation is replicated at Typhoon Exploration, a company based in Laval (near Montréal) and with a focus on properties in the Rouyn-Noranda area. Their flagship project is Fayolle, in partnership with Aurizon Mines who can earn in up to 65%. "Fayolle currently contains about 200,000 oz of gold. Not far from there Aurizon have another project, Joanna, which has difficult mineralogy. Our mineralogy is very simple (free gold), so we think that Aurizon may want to find 500,000 oz on Fayolle and process that ore at the other site to increase its profitability," said Jean-Pierre Thomassin, VP of corporate development at Typhoon Exploration. The 2011 drilling plan at Fayolle is 50,000 m. Thomassin was critical about how the proposed regulatory changes will affect exploration: "The new Mining Law is going to give more power to municipalities, most of which do not have a geologist and so are unable to read a geological map and understand the importance of a mining project."

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As seen with the Joutel and Fayolle examples, the main producers in the Abitibi (namely Osisko, Agnico-Eagle and Aurizon) are developing significant exploration programs in the area, with a good number of joint ventures with junior players. In this model, exploration companies share the risk with a bigger player and know that they will have an operator on their side should they find significant ounces in the ground. Besides which, joint ventures potentially provide for a more efficient use of brains at a time where hiring geologists can be a big challenge.

Adventure Gold Inc., a company concentrated on the Abitibi, is one of the juniors that count gold producers as partners: more specifically, Agnico-Eagle in Québec and Lake Shore Gold on the Ontario side of the belt. At the Dubuisson property, close to the Goldex mine operated by Agnico-Eagle, the latter can acquire an interest of up to 70% if they progress all the way to the feasibility study. Other properties of Adventure Gold include Lapaska, a joint venture with Mazorro Resources with a resource of 80,000 oz of gold, and Pascalis-Colombière, where the company made a discovery earlier this year.

"Dubuisson is less than 1 km from Agnico-Eagle's Goldex mine. If you look at a map, the area covered by the mine is ac-

tually very small. That is why we are not trying to get the largest pieces of land, but the ones where we really believe we have great potential. Agnico-Eagle will be drilling at depth and laterally in our joint venture," said Marco Gagnon, President and CEO of Adventure Gold. Gagnon, who is a former president of the Québec Mineral Exploration Association (AEMQ), also expected good developments in their 100% owned Pascalis-Colombière property, an old site mined in the past by Cambior.

"Last year we finalized the 3-D model, which showed great potential. We are drilling to connect the mineralized zones we already have. We want to bring this property near to the development stage because it would be fairly easy and cheap to put it into operation; with a small open pit and low capex, we would be using the existing infrastructure," he said.


A company that should boost its activities with the support of a recent joint venture is Threegold Resources Inc., where Osisko took a 9.2% interest back in May. Threegold was initially created as a base metals company in 2006 but moved into gold in 2008. Now, Osisko is operating, and earning-in options at the Standard Gold and Adanac properties, while Threegold is also doing work in other gold properties,



Antoine Fournier, vice president exploration and COO, Threegold

mainly South Bay, Shining Tree and Baraute. "The Standard Gold project is going to require a lot of background and development work and Osisko is going to push the project forward much faster. With regard to Adanac, we carried out a diamond-drilling program in 2009 and located an extensive alteration zone in the central part of the property where Osisko decided to further explore," said Antoine Fournier, vice president of exploration and COO, Threegold.

Osisko will have to spend C\$4 million on Standard Gold and C\$4.5 million on Adanac over five years to get 51% interests, as well as provide cash payments of



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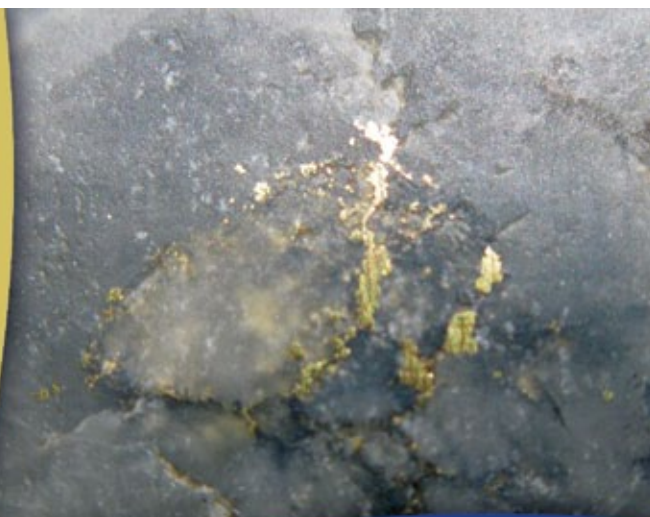
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Gino Roger, President and CEO, Midland Exploration

C\$300,000 and C\$600,000, respectively. "Most people looked at the joint venture as a positive development in the company and our shareholders see it as a major breakthrough for us," Fournier said.

Threegold's interest in base metals is not completely gone, however, as the company is also funding a C\$2 million option to acquire 50% at Lemieux Dome, a copper-zinc-lead-silver-gold property on eastern Québec.

As well as Threegold Resources and the large joint venture with Clifton Star Resources, Osisko also has exploration agreements with other companies, including Golden Valley Mines (whose gold interests are being spun out to another company called Abitibi Royalties) and Midland Exploration (who also has partnerships with Agnico-Eagle, Aurizon and North American Palladium, as well as interests in base metals and rare earths). Golden Valley and Midland are good examples of companies with strong expertise in project generation, who will analyze a wide range of properties before bringing them to the negotiation table with partners in order to share expenditures and reduce risk.

Midland Exploration has Maritime Cadillac, an advanced project less than one km from Agnico-Eagle's Lapa mine. "We have worked for three years with Agnico-Eagle Mines and we are not far from establishing a new resource. Last year Agnico-Eagle decided to open up an exploration gallery going from Lapa to our property, so it is a very promising situation. If the resources are good, the project could go into production very quickly because the infrastructure is already there," said Gino Roger, President and CEO of Midland Exploration.

Midland also announced in July a new gold discovery in its joint venture with North American Palladium at the Laflamme property, and is exploring the Destor-Porcupine break together with Osisko and Aurizon. "Traditionally, the Destor-Porcupine break has attracted less attention than the Cadillac

break, but it is currently a hot spot. I am sure that there will be new discoveries there over the next years," Roger said.

Not young, but still in good shape

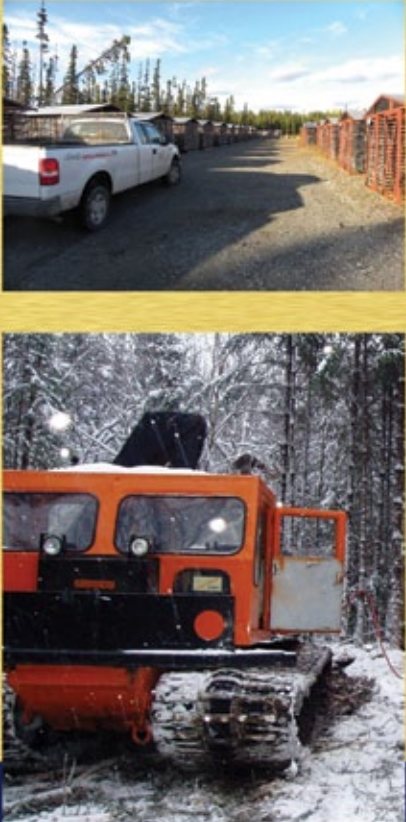
The Abitibi has been exploited for decades, but the renewed activity in the last years is delivering great results. Eric Owens of Alexandria Minerals points out that since 2003, when exploration expenditures started to increase, 25 million oz of gold have been discovered between Val-d'Or and Rouyn-Noranda. The startup of brand new operations like Canadian Malartic, combined with increased drilling efforts under the favorable gold pricing conditions, point to the fact that the Abitibi will still keep its preeminent gold position within the province for a number of years.

In the opinion of Martin Bergeron, vice president of operations at Aurizon Mines, "even if there are mature mines in the Abitibi, there are also important operations. I would not be surprised if we continued to find profitable deposits at depth. Also, we will increasingly see low-grade deposits close to surface that can be exploited as an open pit. We have the advantage of having a pool of human resources and a favorable regulatory environment, even if the Mining Act changes slightly for the worse this year."



Midland Exploration staff in the Abitibi. (Photo courtesy of Midland)

All of this equates to an optimistic environment for gold, according to Shorr of Maudore Minerals. "If you look at central banks' policies and the deficits of the developed nations, you have reasons to be optimistic. Central banks have gone from being massive sellers to massive buyers of about 400 mt of gold per year. People call this a speculative bubble, but countries, particularly in the Far East, are starting to use gold to back their currency. Gold has a wonderful future ahead, particularly over the next decade."



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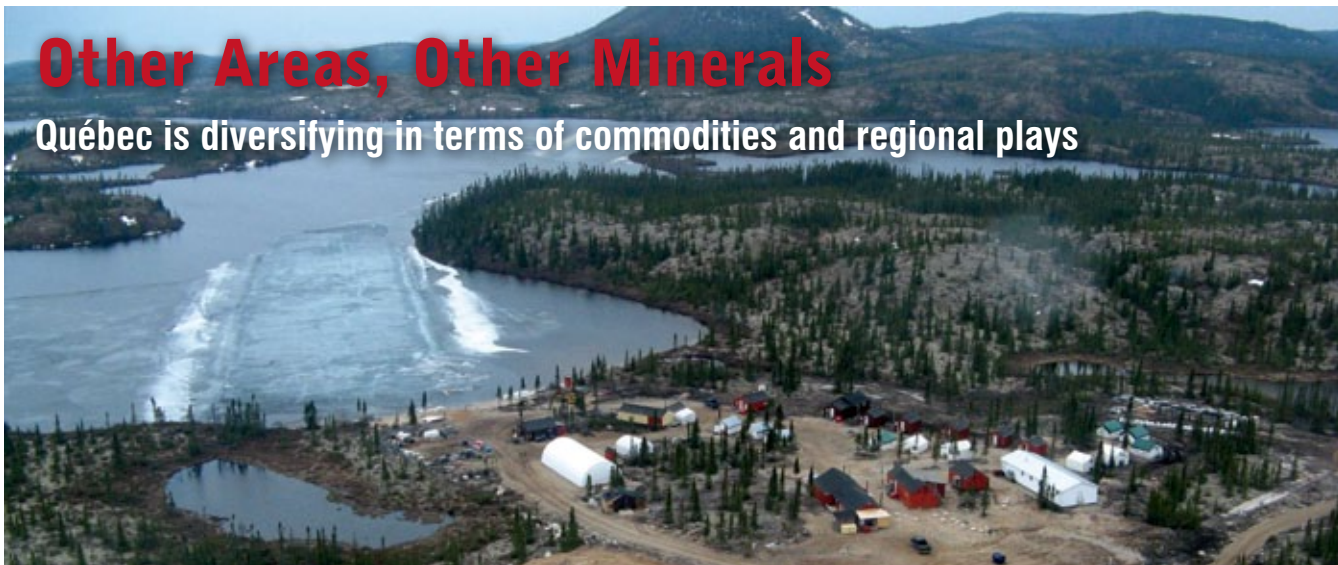
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Québec is diversifying in terms of commodities and regional plays



Renard is expected to become Québec's first diamond mine. (Photo courtesy of Stornoway Diamond Corp.)

Québec is no longer a gold and iron ore camp. In recent years, new exploration efforts by the junior segment and supported by Quebecer institutions, such as investment funds and a dynamic province-owned exploration company (Soquem), have resulted in a varied pool of deposits. The province has lithium, uranium, diamonds, niobium, tantalum, rare earths, titanium and phosphates, among others.

Leaving aside the new iron ore boom in the Labrador Trough, bordering the province of Newfoundland and Labrador to the east, the most exciting 'new' area is the James Bay territory, that took the headlines earlier this year when Goldcorp approved an investment decision to develop its large Éléonore deposit. However, the James Bay is much more than a sole gold mine.

A new mining camp

Québec City based Virginia Mines, the company that discovered the Éléonore deposit and sold it to Goldcorp in 2006, has been very active in the James Bay for about 15 years, under the philosophy that the first mover gets the best value. The company holds a large land position in the area and positions itself as a generator of grassroots projects, although it is also reaping the fruits of its Éléonore success through royalties. André Gaumond, President and CEO of Virginia Mines, explained that Goldcorp's next mine in Québec is potentially a great boost for exploration in the neighboring areas.

"Éléonore is going to be one of the largest underground mines in Canada. Any resources that we can find in the vicinity will have a natural buyer, which is Gold-

corp. We have discovered three satellite deposits, which we still own. Two of these deposits, which are still small, are located just by the road, so it would make sense to transport the ore to the mill."

Gaumond explained that Virginia has 20 active projects at any given time to increase the chances of a discovery. To share risks and funding, the company is eager to sign joint venture agreements. Current partners include Iamgold, Anglo

American Exploration and Quadra FNX Mining. On top of the gold position around Éléonore, Virginia is also advancing a polymetallic project called Coulon. "Coulon is the largest undeveloped copper-zinc-silver deposit in Québec. We believe this is a brand new base metals camp. I believe this will become a mine, probably the second of our discoveries that goes to the development phase if we find the right partner," Gaumond said.



Eastmain Resources has worked in the James Bay since the 1990s. (Photo courtesy of Eastmain)



Jean-Marc Lulin, President and CEO, Azimut Exploration

Coulon's indicated resources stand at 3.67 million mt at 3.61% zinc, 1.27% copper, 0.40% lead and 37.2 g/mt silver, as well as some gold. Additionally there are more than 10 million mt of resource under the inferred category.

Another junior that is actively exploring in the James Bay area since the 1990s is Eastmain Resources, a company where Goldcorp has an 8% stake, and whose 2011 exploration budget is C\$10 million for 46,000m of drilling. The main area of focus is Eau Claire, which contains the Eau Claire gold deposit. Eau Claire has an open-pit resource of 630,000 oz of gold in the first 200m (uncapped; 502,000 oz are M+I with a grade of 5.72 g/t); plus an underground resource of 1.04 million oz of gold, most of which inferred.

"We expect that ultimately Eau Claire will be a multi-million oz deposit. What is interesting is that it has very high grades, mineralization comes right to the surface and the project is sitting on a hill," said Eastman Resources President and CEO Donald Robinson.

On top of the gold, Eau Claire has significant amounts of tellurium, used in solar panels and the computer industry.

The company is also exploring the Éléonore South project, a joint effort together with Goldcorp and Azimut Exploration; and it owns the old Eastmain mine with historic resources of 255,000 oz, which it acquired at a cost of US\$16 per ounce. The site could receive a major boost if the Québec government goes ahead with the construction of a new road in the area. "Geologically, the James Bay is the same as the well-known mining districts throughout the Canadian Shield, like Red Lake, Timmins and Val d'Or, and this is why we went there in the first place. In the timeframe that we have been working on up there, the infrastructure has improved remarkably," said Robinson.

Working in more remote areas is definitely more burdensome, but it can also be more rewarding. Azimut Exploration, a junior company based in Montréal, is looking for world-class discoveries in northern Québec that will open up new camps. "In incremental discoveries, you need previous deposits to put the new discovery into production. A founding discovery, however, will justify on its own the construction of new infrastructure," said Jean-Marc Lulin, President and CEO of Azimut Exploration.

To achieve this, the company supports its early exploration efforts with a systematic evaluation of the province's geological databases as a way to define targets. "Québec is well known worldwide for having one of the best databases of geological, geophysical and geochemical data covering the entire territory. Information is available for virtually all of the exploration work carried out over the last 80 years," Lulin said.

Azimut's focus is on gold, uranium, copper and rare earths, in deposits with potential for open pit exploitation: "For us, the emerging mining region of the James Bay is still 'southern' Québec. We are looking for deposits even further north, where mining would be done using the open pit method. Very few people live there so min-

ing could provide them with true long-term leverage for economic development."

Lulin defended the importance of project generators like Azimut in the exploration business: "If you do not bring in new ideas, you just recycle old projects. At high metal prices, old projects can be economic, but that changes during low cycles."

As Azimut defines new targets, its strategy is to sign joint venture agreements to share the risk: "Over the last seven years, we have signed 29 option agreements representing total partner-funded exploration expenditures of C\$94 million," Lulin said. Azimut has 25 properties and current partners include the aforementioned Goldcorp and Eastmain, as well as Aurizon Mines.

Québec's first diamonds mine

Also in the James Bay Territory, Stornoway Diamond Corp. is advancing its Renard project into production; if things go as planned it will be the province's first diamond mine by 2015. The current 43-101 resource is 24 million carats (indicated) and 17 million carats (inferred). The company believes that there is potential for a further 24-49 million carats, which would be cheaper to explore once the deposit is into production. "Most of the value is concentrated on two high-grade

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pipes (Renard 2 and Renard 3); then we have some others that are in our inferred resources and will be part of our business plan in the short future," said Patrick Godin, COO of Stornoway Diamond Corp.

Renard is currently 100%-owned by Stornoway, after governmental company Soquem traded its 50% interest for a 37% stake in Stornoway last year. Planned 2011 highlights include the completion of the bankable feasibility study and the environmental and social impact assessment.

The feasibility study is expected to incorporate significant changes to the preliminary economic assessment, Godin explained: "We are looking to increase the throughput to 6,000 mt/d. Furthermore, we want to connect the mine with the provincial electrical grid, so we are financing a feasibility study for a 165 km power line. Oil prices are high and we want to mitigate the power risk from the start."

While infrastructure issues are being solved as the project advances (Stornoway and the Québec government have reached agreements to fund the construction of a road in the framework of the Plan Nord), the company will need to work hard to get all the people it will soon need. "Just where we are, in northern Québec, the

mining industry will need 2,200 people in five years, and 5,000 people in 10 years," Godin said.

Base metals and more

Another company that will benefit from the new Otish Mountains all-weather road is Western Troy Capital Resources, its most advanced project is McLeod Lake just 70 km from the proposed highway. McLeod Lake is a copper-molybdenum scenario whose in-pit resource used as basis for the scoping study was 217 million lb of copper and 32 million lb of molybdenum, as well as some gold and silver (indicated + inferred). The molybdenum-equivalent grade is 0.189%. The company is now working on its feasibility study, expected to be completed in early 2012, with a view to reach first production in mid-2015. Capex will be in the region of C\$270 million, which would include the investment in a hydroelectric run system on the Eastmain River.

"The overall grade of the deposit is 75% higher than the average of existing producers of copper-molybdenum surface mines around the world. We can conceivably start construction in 2012, but I think it will actually commence in 2013 after we have raised financing and ordered



Jack Stoch, President and CEO,
Globex Mining Enterprises

equipment," said Rex Loesby, President and CEO, Western Troy.

In addition to McLeod Lake, Western Troy is working on other base metals prospects around Québec, namely the Deborah Lake copper-gold project near Schefferville (which attracted Agnico-Eagle to invest C\$1 million in the company last year) and the Lake Chibougamau copper project.

A company currently focused on base metals and iron ore is Ottawa-based Beaufield Resources. The company has optioned out some projects in Québec and Ontario and is focusing on its 100%-owned properties in Québec: the Tortigny base metals deposit, the Schefferville iron property in the Labrador Trough and finally Opinaca, a gold property located 6 km from Goldcorp's Éléonore mine.

This year, most of the budget is dedicated to the first two properties. "Tortigny is a copper-zinc-silver situation with some cobalt and gold as well. It has very high grades, but it is not very large in tonnage, at least at this stage. We are focusing on the near-to-surface mineralization to make a first resource calculation and a scoping study. It is a massive sulphide-type deposit, and usually this type of mineralization occurs in groups, so we are going to look for similar deposits at depth and around the area," said Jens Hansen, President and CEO of Beaufield.

In June, the company completed a 9,700 m drilling campaign at Tortigny.

With regard to Schefferville, Beaufield is spending C\$1.5 million this year on ground exploration, after it completed an airborne survey. "We believe we have very interesting direct shipping iron ore targets," said Hansen, who does not see the area as an iron ore-only property. "The Québec government did a regional lake bottom geochemical survey a number of years ago in the Labrador Trough. Besides iron ore potential in the area, this survey

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showed interesting zinc mineralization. When there is one mineral around, you often find others, plus our property is very big, 43 km long and 10 km wide, 100% on the Québec side. We are not getting any credit for the iron project even though potentially the Schefferville project could eclipse the Tortigny project," he said.

A company with a wide variety of interests all around Québec and other areas in North America is TSX-listed Globex Mining Enterprises, with its base in Rouyn-Noranda and a portfolio of 110 properties (37 of which with historical or 43-101 resources).

The company has a strong position in the Abitibi, and a number of options and royalty agreements in place (partners in Québec include Richmond Mines, Queenston and Xmet).

"The biggest problem we have is that people think that we are not focused. We can be involved in more than one thing at the same time and we think that projects should be looked at if they are valuable. We have been in the market for 24 years, but brokerage firms do not recommend us because we have not done large financings, even though unlike other juniors, we make money," said Jack Stoch, President and CEO of Globex.

The company is currently considering a number of spin-outs, although the markets have not been favorable for such restructuring for the last months. In Québec, new companies would be created to manage the company's position in the Chibougamau mining camp, where it has six former gold-copper mines, and to focus on the Kipawa uranium-gold-rare earths interests. On top of that, Globex is active in iron ore exploration, and controls a technology company that has a process for gold extraction from refractory ores. Outside of Québec, one of the company's main assets is the large Timmins talc-magnesite deposit in Ontario. "Globex is unique from other junior companies as we view the final product we seek to produce as money," Stoch said.


With regard to its hydro-metallurgical gold recovery technology, Globex plans to benefit from it on two fronts: leasing out the technology to clients on one side, for both gold production and environmental remediation; and acquiring projects with refractory gold ores as well as tailings, to put them into production on the other. "Our process effectively recovers the vast majority of the gold in refractory ores, while stabilizing arsenic residues and thus eliminating an environmental problem.

Test work we have completed proves that the method works. We plan to eventually spin this technology company off to shareholders as it is a hidden asset within Globex and its value is not recognized," Stoch said.

Gold in the south-east

At current gold prices, it makes sense to reexamine old areas that were once considered mature. This is what is happening in the Abitibi, but also elsewhere. In south-eastern Québec, reachable in 3.5 hours by road from Montréal, a number of companies have been ramping up their exploration programs post-crisis, helped by the improved access to funding and global gold fundamentals perceived as being very strong.

One of the companies active in the area is Fancamp Exploration, a diversified junior with interests in several commodities, including iron ore. Its president, Peter Smith, described the geology in this region: "The Beauce, where we hold a large property, is the site of Canada's first great gold rush in the 1840s, 1850s and 1860s. It is estimated that hundreds of thousands of oz of gold were extracted by the end of the 19th century, mainly from a layer beneath the glacial deposits in the val-



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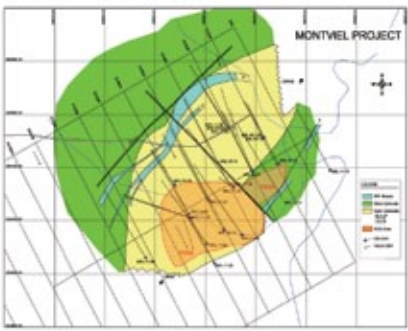
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Montviel property

- World class deposit of Neodymium;
- NI 43-101 resource calculation : Indicated 183.9 Million tons averaging 1.45% TREO and Inferred 66.7 Million tons averaging 1.46% TREO.
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ley of the Gilbert River and its tributaries. Recent exploration by us suggest that this gold was derived largely from the bedrock immediately beneath the 'placers' which could be considered a reworked saprolitic horizon of Tertiary or earlier age."

To have a better understanding of the region, Fancamp completed a VTEM airborne survey of 14,500-line km in the area a few months ago, including the Beauce property as well as other land holdings along the spine of the Appalachians that include base metals interests. "Large numbers of conductive and other targets have been identified. We are cross-checking them with an enormous database of historical showings and geochemical anomalies compiled over the years by the government and others," Smith said.

Other players in the region include Golden Hope Mines and Bowmore Exploration, a company established in 2008 that has a strategic partnership with Osisko, who own 39% of Bowmore.

The company is exploring for large bulk-tonnage, open-pittable deposits in Mexico and Québec, with the St-Victor property in the Eastern Townships and the Duvernay project in the Abitibi.

"The St-Victor sedimentary belt runs for about 150 km in length. We did exten-

sive prospecting, pulling 3,500 samples and identified three strong gold anomalies in the area. We ended up acquiring 69,000 hectares along that belt. In St-Victor we have a conceptual model similar to Kinross' Paracatu deposit in Brazil. It is a sedimentary-hosted, low-grade deposit," said Paul Dumas, President and CEO of Bowmore Exploration.

The 2011 drilling campaign at St-Victor only started in April even though the company had been ready to drill since January. Current inhabitants in southeastern Québec certainly do not remember gold extraction in the 19th century, therefore mining appears as a new activity that needs to be explained to them.

"We ran into some issues with the local communities. A handful of environmentalists quickly activated a lot of negativity about exploration. We had to organize sessions to inform the locals. Economically this is an un-favored area with industries closing so this could be an opportunity to create employment," said Dumas.

Favorable to Bowmore is the relationship with Osisko, not only in terms of access to funds, but also to exploration knowledge.

"We want to find a deposit. If we go into a property, we either kill it or make



Paul Dumas, President and CEO, Bowmore Exploration

it. If it does not fit certain criteria, we will just drop it and move onto something else. The advantage of our relationship with Osisko is that we have access to a lot of expertise from them, and if we get good results, we will be on fire," Dumas said.

From past production and present exploration activities, the south-eastern Québec region seems to offer interesting geological potential. There are certainly some challenges like the lack of mills in the area and the presence of anti-mining sensitivities, however these should be surmountable through capital investment and good community work.

Just the beginning

As the mining sector projects itself further north in a province with a massive territory, it is not easy to decide where to start. The James Bay is opening up with discoveries in a wide range of commodities, while infrastructure is meant to improve remarkably in the medium term with the help of the Plan Nord.

"Mother Nature didn't put an X on a map for us to know the location, but she gave us tips. It is a big puzzle formed millions of years ago; we just need to know how to use the tips.

It is a fascinating business," said André Gaumond of Virginia Mines, who reminded us that the James Bay already has "two uranium deposits, two large iron deposits, a diamond deposit, four or five gold deposits, a copper-zinc-silver deposit (Coulon), a nickel-platinum-palladium belt (Gayot) and lithium."

As will be explored in following articles, the province hides an excellent potential in strategic minerals and rare earths. It is also regaining its former glory in iron ore, both in the Labrador Trough and in other areas.



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Rare Earths and Strategic Minerals

Putting Québec on the critical resources map



A rosy picture: China's cuts in rare earths exports place Québec in a privileged position. (Photo courtesy of Matamec Explorations)

The evolution of technologies in industries like electronics, energy, defense or the hybrid automotive sector, as well as the world's increasing population, means more commodities are needed and in larger volumes. The scarcities of some of them, or the unfriendliness of jurisdictions in which they are traditionally produced, are pushing explorers to look for new deposits; Québec is appearing as an ideal alternative for many.

The rare earths, a group of elements essential for new technologies, are at the forefront of the discussion. China, the world's dominant producer and exporter, is cutting exports to allow for the reorganization of local producers (many of which have a bad environmental and safety record) and feed its strategic industries; the country is expected to become a net importer of heavy rare earths as soon as in 2015. "Those affected by the Chinese cutbacks are the western Economies with important high-tech and green-tech industries, such as Western Europe, the U.S., Japan and Korea. You have industries worth billions of dollars that would collapse if they saw their rare earths supply cut," said Peter Cashin, President and CEO of Quest Rare Minerals Ltd., the company advancing the Strange Lake project in northern Québec.

The price of some of these earths has rocketed as a result. In September last year, Quest Rare Minerals announced the results of a preliminary economic assessment at Strange Lake, which provided for a pre-tax net present value of C\$1.4 billion (12% discount rate) and a pay-back period of just four years for a mine life of 25 years yielding an average of 12,500 mt/y of total rare earth oxide (TREO). Capital expenditure

would be C\$563 million. "Strange Lake is a large, easily accessible, open-pitabile deposit. We have undertaken metallurgical studies and we do not have the refractory issue; we have good recoveries with conventional acid leach," Cashin said.

The most important earths at Strange Lake are neodymium, europium, terbium, dysprosium and yttrium, as well as ap-

preciable quantities of ytterbium, lutetium and holmium. Since there is no separation and refining capacity of rare earths in North America, the firm envisages finding a partner to build such a plant and add value instead of just produce concentrates. Quest's plan is to finish the pre-feasibility study by the end of this year and be in full production by 2016.

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Peter Cashin, President and CEO,
Quest Rare Minerals

Cashin believes his company's position is greatly boosted by the fact that Strange Lake is rich in heavy rare earths: "China has a controlling position in the market of about 97% of the supply of rare earths. Approximately 99% of their supply is light rare earth dominant. We are talking of hundreds or thousands of dollars per kilogram for the heavies, versus tens of thousands of dollars for the lights."

Montréal-based Matamec Explorations is also working on the rare earths front with the idea of being into production in 2016 at the Zeus property in southern Québec, containing the Kipawa deposit. André Gauthier,

President of Matamec, provided more details about the company's flagship project. "Zeus has 60% of light rare earths and 40% of heavy rare earths like dysprosium, terbium and yttrium. Our idea is to produce 5,000 mt/y. Every car needs lanthanum, cerium, neodymium, praseodymium, dysprosium and terbium and we believe the automotive industry can absorb a good part of our production."

Zeus is easily accessible and close to power and rail infrastructure, amongst other advantages it offers. "Rare earths processing requires lots of acid and in Rouyn-Noranda we could be getting sulphuric acid from Xstrata's refinery. Our main mineral for rare earths is eudialyte and our metallurgical tests have shown very good recovery rates with acid magnetic separation, and with no need of flotation, of 82% TREO up to the purification and precipitation stage. This will make our deposit very competitive against Chinese producers and with a lower environmental footprint," said Gauthier.

The Kipawa deposit currently stands at 63,850 mt of TREO (indicated) and 17,780 mt TREO (inferred).

Another player that has received significant attention since its listing last year is GéoMégA Resources, which has just released its first 43-101 resource calcula-

tion at the Montviel carbonatite property, with 184 million mt at 1.45% TREO indicated plus 67 million mt at 1.46% inferred, using a cutoff grade of 1%. The resource includes 606,000 mt of neodymium and 5,840 mt of dysprosium. "This is one of the largest TREO indicated resource outside China. Both mines coming on stream in Australia are light rare earths. They have higher grades than us but they are smaller in size. Montviel is a world-class neodymium resource eligible for the Plan Nord, near surface (open-pittable), road-accessible and close to electricity and available labor," said Simon Britt, President and CEO of GéoMégA.

"The market for rare earths is set to grow between 8% and 11% annually just because of electric vehicles and wind turbines. These two sectors are booming and depend on permanent magnets. This is why we are very bullish on Montviel. Everyone is focused on the heavies like dysprosium, but neodymium is very important as well," said Britt.

For Britt, who anticipates Québec will become a major rare earths supplier in the future, metallurgy is key to rare earths deposits. "There is a track-record for a handful of carbonatites such as Bayan Obo in China being put into production, but recov-

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Dominique Bouchard, President,
Rio Tinto Fer et Titane

ering rare earths in an economic fashion for commercial production is not an easy thing," he said. This is why the company is already busy with metallurgical tests.

Together with Quest, Matamec and GéoMégA, other companies active in rare earths are Vancouver-based Commerce Resources with its Eldor property where an initial 43-101 resource of significant size is already in place at the Ashram deposit; Ditem Explorations, working at its Lac Henri property in the Otish mountains; Focus Metals, in partnership with Soquem at their Kwyjibo IOCG property; and Midland Exploration, who have Japan's JOGMEC as partners at their Ytterby project, located just a few km south of Quest's Strange Lake deposit.

JOGMEC can acquire 50% of Ytterby before March next year if it contributes \$2.7 million in exploration expenditures. Immediately after signing the option agreement, Midland discovered two new alkaline REE systems. "We have found significant amounts of light rare earths, but also heavies including dysprosium. We are at an earlier stage than Quest and Matamec, however we believe that we can be sitting on a very large system which could benefit from good synergies with Quest's deposit. Japan is desperate to find new rare earth suppliers and the agreement with JOGMEC is very important for us because it gives us access to potential end users," said Gino Roger, President and CEO of Midland Exploration.

The lithium fever

The lithium market was affected by the 2009 crisis, but the long-term fundamentals of this commodity continue to be overtly optimistic. While reserves of brine-based lithium are concentrated in the South American triangle that hosts the salt flats in Chile, Argentina and Bolivia, the boom of lithium batteries for hybrid and electric



Québec offers tremendous potential for hard-rock lithium projects. (Photo courtesy of Canada Lithium)

vehicles is prompting end users to diversify their sources of supply. Québec, already home to two companies developing lithium storage technologies, Phostech Lithium and Bathium, is now looking upstream with a number of hard-rock lithium projects under development.

The first one in line is the Québec Lithium Project operated by Canada Lithium, an old lithium mine closed down in the 1960s located near Val-d'Or. It is still expected to be in full production by 2013 in spite of the setback suffered by the company earlier this year when it had to revise its mineral resource to a significantly lower figure than

it had announced in 2010. The updated resource is 29.2 million mt with a lithium oxide grade of 1.19%, plus 20.9 million mt at 1.15% Li_2O . The updated feasibility study, although incorporating higher production costs of C\$3,164/mt due to a higher stripping ratio, maintains a mine-life of nearly 15 years and production of 20,000 mt of lithium carbonate per year, with initial capex of C\$202 million.

Peter Secker, President and CEO of Canada Lithium, compared its hard rock asset to the brine operations in South America. "There is lots of lithium around, but the point is how to produce high-quality lithium. Be-



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cause producing from brine is a complicated process, you tend to have lower recoveries and higher levels of chlorine, sodium and potassium. The hard rocks tend to be much purer, so more likely to give battery-grade lithium."

Canada Lithium has an agreement with Mitsui, which will act as a marketing agent in Asia. For Secker, China will be the key in the evolution of the lithium business. "China is at the forefront of electrification and they have two problems: carbon emissions and gasoline imports. China will soon be the largest car manufacturer in the world, with 20 million new cars every year from 2020, so the cost of gasoline would be significant, hence their impetus into urban electrification. Electric scooters are booming in China: 20 million were sold last year. Moreover, China is subsidizing electric vehicles," he said.

Another advanced lithium project is Whabouchi, operated by Nemaska Exploration. Located in the James Bay area, the project has measured and indicated in-pit resources of 25 million mt at 1.54% Li₂O, plus 4.4 million mt at 1.51% inferred. Nemaska intends to start producing spodumene concentrate by 2013 that will be fed to Chinese processors (the Chengdu Tianqi Industry group are strategic partners and



Michel Robert, director, and Jean-Sébastien Lavallée, President and CEO, Critical Elements Corp.

own a 10% stake in Nemaska); however a plan for a lithium carbonate plant on Québec soil to target the North American and European markets is also on the table. "We could be sending 100,000 mt of concentrate to China and process the remaining 100,000 mt in Québec, using the technical expertise of our partner," said Guy Bourassa, President and CEO of Nemaska Exploration.

The preliminary economic assessment contemplates an investment of C\$86 million and production of 202,000 mt of con-

centrate per year over a 15-year mine life. According to Bourassa, Whabouchi is the second richest spodumene deposit in the world in terms of grade. He also defended production from spodumene as opposed to production from brine, for its quality and because a competitive market requires it. "The brine players claim they have reserves for more than 1,000 years; if that were true, why should there be other producers? The world is not ready to go from a quasi-monopoly of oil sources by certain countries to a similar situation in lithium as the world adopts electric vehicles," he said.

Bourassa emphasized that Québec, being a safe jurisdiction, will become a significant lithium producer in the medium term. "Everybody speaks of the famous lithium triangle in Bolivia, Chile and Argentina. But if you look at the Québec map with all the lithium projects, we do not have a triangle but a 600 km circle where we have over 100 million mt of spodumene with grades of at least 1.2%. That is unseen anywhere else in the world," he said.

Australia-based lithium producer Galaxy Resources has also entered Québec's lithium market through an agreement with Lithium One, by which it can acquire 70% of the James Bay lithium pegmatite project. The property has 43-101 resources of 11.75 million mt at 1.3% Li₂O (indicated) and 10.47 million mt at 1.2% Li₂O (inferred). Galaxy will have to pay C\$3 million to Lithium One, and deliver a feasibility study within two years.

"Galaxy is an excellent partner because they have already secured off-take agreements for their current production, which is mined in Australia and will be processed into lithium carbonate at their plant in China. Plus, they have announced they will enter the battery business themselves to serve China's explosive electric bike mar-

Gold exploration and strategic metal development



Quebec

Feasibility study
Crevier Nb-Ta: MDN 72.5% / IAMGOLD 27.5%

Advanced drill program
MCGOLD: 43-101 resource: 167,000 oz Au

Tanzania

Gold Producer
Tulawaka Mine: ABG 70% / MDN 30%

Advanced drill program
Ikungu discovery: MDN has 70% option

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ket," said Lithium One's President and COO Patrick Highsmith.

Lithium One is also present in the 'brine triangle' with a project in Argentina. Highsmith believes there is space in the market for both brine-based and hard rock-based lithium. "There is certainly an argument that brine operations will be cost leaders. However lithium really is a specialty industrial chemical. Its properties are unique, and in all our discussions with potential strategic partners, price has not been their primary concern. This is a commodity that battery makers must have to make the electric vehicles of the future. In this context, the stability of supply is key; stability of supply from Québec cannot be doubted and there is excellent access to markets."

While there are other companies exploring for lithium in Québec that are at earlier stages (such as Rock Tech Lithium at its Kapiwak and Lacorne projects, and Conway Resources at its LITCO-1 property), there is another project that stands out: Critical Elements Corp.'s Rose tantalum-lithium pegmatite project.

Rose has an indicated resource of 11.4 million mt at 165 parts per million of tantalum pentoxide and a lithium grade of 1.34%, plus 2 more million mt in inferred

resources. The company assures the project would be easily put into production, as it is close to the surface in a terrain with a 12% inclination, but lithium and tantalum being industrial minerals the company is looking for a specialized buyer that will sustain the project economically.

Jean-Sébastien Lavallée, President and CEO of Critical Elements, declared that since the company (previously called First Gold) changed focus from gold to strategic minerals, it has advanced Rose rapidly with an efficient use of capital. "We have spent C\$3 million since we acquired Rose, and now we are spending another million in drilling and 1 million extra for the pre-feasibility study. After a total investment of C\$7 million, we will be in a position of taking a production decision. The capital expenditure to develop the project could be in the region of C\$125-150 million. We are lucky because we are close to a road and have an electric line by the project, and a small airport 30 km from us, at Wemindji," he said.

The company is working on an updated resource calculation that will include some tantalum-only areas that were left out in the previous resource.

"The deposit value is approximately 60% lithium and 40% tantalum, but for the medium term it could get to a 50:50

scenario because the value of tantalum is increasing. An important share of tantalum comes from Rwanda and Congo, and since March 2011, users in the U.S. need to prove their tantalum does not come from conflict areas. Tantalum, which traded normally at about US\$60/lb, went up to about US\$160/lb," said Michel Robert, director of Critical Elements Corp.

Tantalum and niobium

The improved tantalum fundamentals will also benefit MDN Inc., a Montréal-based company with activities in Africa (it owns a 30% interest in a gold mine operated by African Barrick Gold in Tanzania) and its main assets in Québec include a gold project optioned from Soquem (with a resource of 160,000 oz gold), and the Crevier niobium-tantalum project. The company currently owns 72.5% of Crevier and has an option to increase its share to 87.5%; the rest is with lamgold.

As per the scoping study published in January 2010, tantalum accounts for 35% of the value of Crevier, however that figure will be revised in the ongoing feasibility study that will incorporate the higher tantalum prices. Other highlights of the PEA are: capital expenditure of C\$316 million; a mine-life of 18 years with a

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Niobec, operated by lamgold, is Canada's only niobium mine. (Photo courtesy of lamgold)

daily throughput of 4,000 mt; and annual production of 1.7 million kg of niobium and 178,000 kg of tantalum. This year the company has also been involved in a 215-mt pilot plant test to finish the details about the processing. "The niobium-tantalum deposit is more complex than a copper deposit or a gold deposit, so it makes sense to optimize the metallurgy before taking a production decision," said Serge Bureau, President and CEO, MDN.

The company's plan is to complete the feasibility study by the year-end, acquire a strategic partner to develop the project and probably spin-off Crevier with an IPO.

Bureau provided more details about the niobium and tantalum markets. "Tantalum is mainly used in capacitors, which are installed in computers, cell phones, and all the devices that are miniaturized. It is also used in the automotive industry for the manufacturing of airbags. These are all high-technology applications. Niobium is also used in high-specialty steels for airplanes, for example. While lamgold produces ferro-niobium, essentially dedicated to the steel industry, we are going to produce niobium oxide used in high-technology markets."

The lamgold niobium mine that Bureau is referring to is Niobec, a site employing 400 people in Québec that is one of only three significant producers in the world (the other two are in Brazil). Processing an ore with an average niobium grade of 0.61%, it produced 4,400 mt of niobium last year, 7% of the world's total estimated at 63,000 mt by the U.S. Geological Survey.

Earlier this year lamgold announced a new resource estimate of 1.92 million

mt of contained niobium (M+I, a 691% increase over the previous figure; grade is 0.42%) plus 1.24 million mt in the inferred category. The company plans to capitalize on this resource and the favorable niobium prices to increase production threefold and reach 15,000 mt/y of niobium, while expanding the minelife beyond a 40 year period.

"When we purchased Cambior in 2006, we had to explain that we would keep a niobium mine, even if we were a gold company. In the last couple of years niobium prices have been strong and we believe they should still increase in the medium term. The company is analyzing the possibility of spinning out the niobium production in order to unlock all the value of Niobec," said Renaud Adams, senior vice president operations for the Americas at lamgold.

The company is considering selling a 10%-20% stake to a minority partner, and is also evaluating the potential for rare earths within the site.

Uranium

2011 has been a tough year for uranium. The devastating earthquake and tsunami that led to the nuclear disaster at the Fukushima I power plant in Japan have taken a toll in the market valuation of uranium companies. Although uranium price has not reached the US\$40/lb bottom it touched during the financial crisis, raising funds for new projects has certainly become a more difficult task since March 11. As time passes by, the wounds of Fukushima should heal and the market, together with the politicians dictating energy policy worldwide, will probably support the idea

that nuclear is an efficient source of energy moving forward. If that is the case, while other Canadian provinces like British Columbia are banning uranium-related activities, Québec is ready to add its rich potential to Canada's uranium production, currently concentrated in Saskatchewan.

The province's most advanced uranium project is Matoush, located in the Otish Mountains and operated by Strateco. The resource, from 2009, is 7.46 million lbs of contained U_3O_8 in the indicated category (grade is 0.78%) and 12.77 million lbs U_3O_8 inferred, with a 0.50% grade. If developed, Matoush would become the first uranium mine in Québec and the first to be licensed in more than 25 years in Canada.

"Grade is king in mining and Matoush has one of the highest grades outside the Athabasca basin, with 6,000-7,000 ppm. Mines in Africa have 400-600 ppm. In uranium mining the most important issue is not the radiation or the radon gas, but water treatment, which is expensive. In the 200,000 m of drilling we have done, we do not have any water. Saskatchewan has very high grades in uranium, but the water issue can make projects uneconomic. Cigar Lake is a good example; it was flooded with water," said Guy Hébert, President of Strateco Resources.

Current figures, as per the 2010's scoping study, are a capital expenditure of C\$300 million and an operation of 750 mt/d to produce 2.6 million lbs of uranium annually for seven years; the company is confident the 70,000 m drilled between 2010 and 2011 will significantly boost the resource. In spite of Fukushima, Hébert is confident the fundamentals of the uranium market remain strong for the future. "Current demand for uranium is about 180 million lb, for about 440 operational reactors. Each reactor takes about 500,000 lb/y and the initial load is two million lbs. The supply from the mines last year was about 140 million lb, so there is a shortage. If there are 50 new reactors, just the initial load is another 100 million lb," he said.

With these numbers in mind, exploration companies continue to outline areas with potential for uranium mines. One of these juniors is Uracon Resources. "If you look at the basic supply-demand balance, I would not be surprised to see prices moving towards US\$90-\$100/lb over the next few years. The world needs green power. Thirty years ago uranium would have been last on the list of clean sources of energy, and now it is seen as one of the cleanest and most efficient sources," said Gregg

Sedun, chairman and CEO of Uracon.

Uracon is working in north-eastern Québec with the idea of looking for low-grade, bulk tonnage uranium deposits that can be developed as an open-pit, and uses some operations in Namibia as examples that these deposits can be very profitable. So far, Uracon already has a 43-101 resource of 6.9 million lb of U_3O_8 (indicated, grade 0.014%) plus 37 million lbs in the inferred category (grade 0.012%) from three zones at their Turgeon claim group, and is looking for higher-grade areas to complement the resource, mainly in the Costebelle area.

"We believe we should have about 60 million lb U_3O_8 in low-grade ore as a starting point. The resource area we have now is open in all directions, so we can grow the tonnage there with additional targets. If we get 15-20 million lbs in high-grade we can combine both resources and move forwards using that as a base. So far we have a resource based on a grade of 120-130 ppm and the areas we are looking at in Costebelle have around 250 ppm," said Marc Simpson, exploration manager, Uracon Resources.

Chairman and CEO Gregg Sedun emphasized the importance of working in a friendly jurisdiction in a sensitive business



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such as uranium. "It is ironic that Vancouver is seen as the center for junior companies worldwide, but yet British Columbia has banned uranium exploration. By contrast, the Québec government has been fantastic. I have had meetings all the way to the Premier and we have got nothing but fantastic support. They are very strong on the consultation side."

Other companies exploring for uranium in Québec include Azimut Exploration, Abitex Resources and Golden Valley Mines, which has spun out its uranium assets under a new company called Uranium Valley Mines. Jean-Marc Lulin, President and CEO of Azimut Exploration, compared Québec and Saskatchewan for uranium exploration. "Within Canada, 25% of the uranium projects are in Saskatchewan and 25% in Québec. The problem in Saskatchewan is that the region is already mature, whereas in Québec that is not the case."

Graphite

New technologies are increasingly demanding about the quality of the materials used. Together with the aforementioned lithium, rare earths, niobium and tantalum, Québec can become an excellent source of graphite, a material that has gained the spotlight as the European

Union and the U.S. have classed it as a critical mineral. Focus Metals is advancing its Lac Knife project near the town of Fermont, with a plan to be in production in 2014.

The project has a historic resource of 8 million mt and a grade of 16.7% graphite, which is very high for industry standards. According to the preliminary plan, Focus Metals would produce 20,000 mt/y of 95% graphite, and additionally 3,000 mt/y of 99.95% graphite, for a 40 year mine-life. Capex would be C\$75 million.

"Our advantage is that we have a grade of 17%, therefore to get 1 mt of 95% graphite we just need to process six mt. Plus, 60% of our deposit is medium to large flake graphite. Our cost for 95% graphite is going to be around US\$350/mt, and being large-flake graphite it sells for US\$2500/mt. When you get to the 99.95% graphite for the battery technologies, the prices go from US\$10,000 to US\$40,000/mt, while the incremental cost for us is perhaps US\$1,000/mt. We are currently working on a partner that can provide the purification technologies," said Gary Economo, President and CEO, Focus Metals. The company is working to validate its historic resource under the 43-101 standard.

Graphite consumption will grow in parallel to lithium batteries consumption, while it is expected to increase its usage in other high-tech applications. "There is more graphite in a lithium battery than there is lithium. The demand for large quality, large-flake graphite is expected to grow like crazy, at rates of more than 20% annually."

"There is a lot more to graphite than meets the eye," said Economo. "Electronics thermal management is an application that did not exist 10 years ago. Then there is graphene, which is the single atomic layer of graphite flake. Graphene is extremely strong and is thermally and electrically conductive. Therefore, you could replace silicon and make solar cells with graphene to increase efficiency by 50 or 100 times. There are also many medical applications, because bacteria do not grow on graphite, but human cells do. A material so light and so strong also offers impressive applications in defense and aerospace. Graphene will change our lives completely."

Titanium dioxide

At Rio Tinto Fer et Titane (formerly QIT), Québec has a significant producer of titanium dioxide. The company operates a mine

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at Havre St-Pierre described as the biggest solid ilmenite deposit in the world, and 800 km south of it at Sorel-Tracy, a large metallurgical complex employing 1,700 people, which is Rio Tinto's largest titanium dioxide smelter. Annual production is roughly 1 million mt of titanium dioxide, mostly for the paints industry; one million mt of iron products; and steel products.

"We have a plan to extend the life of our mine in Havre St-Pierre until 2050, at least. That means 100 years of mining, which is very impressive," said Dominique Bouchard, President of Rio Tinto Fer et Titane.

Running an enormous industrial operation, Bouchard praised the availability of power in Québec. "Québec offers a great advantage with the availability of low-cost green electricity. The rates are stable and predictable going forwards. We are one of the largest consumers of electricity in Québec; our plant can take up to 600 MW."

Québec could see a second titanium dioxide producer in junior company Argex Mining, who is advancing the La Blache project where it recently released a 43-101 resource estimate of 30.9 million mt at 18.8% TiO₂ and 63.3% Fe₂O₃ (M+I) and additional 13 million mt inferred.

"La Blache is an ilmenite magnetite deposit with a lot of vanadium credit as well. It is not the same mineralogy as the sands, but it is similar to what has been mined in Ukraine, Finland and Norway. Approximately, two thirds of the value of the deposit is titanium oxide; the rest is more or less evenly distributed between iron and vanadium," said Michael Dehn, until recently President and CEO of Argex.

"Our great advantage is that out of every mt of rock, 90% to 95% is going to be payable material which is a massive difference to a gold mine. The capital cost should be C\$2 billion for production of 600,000 mt of titanium dioxide per year. At full production we should be producing about 2.4 million mt/y of iron and 25 million lb/y of vanadium pentoxide as well, which would position us as the largest producer of vanadium in North America," Dehn said. Argex would like to reach full production by 2013.

Phosphates

Québec hosts an interesting project that could take the baton from Kapuskasing (Ontario) as Canada's only phosphates mine. It is the Lac à Paul project operated by Arianne Resources (more specifically under its subsidiary Canada Phosphate), a company whose market valuation has trebled since the beginning of the year. Management at Arianne acknowledges that phosphate is



Bernard Lapointe, CEO, Arianne Resources

seen as a less strategic mineral than potash, for instance, but they believe North America will soon be asking for more producers as there is a clear supply deficit.

"There are three important components in fertilizers: nitrogen, potash and phosphate. Potash is seen as more strategic because it is not widespread. Phosphate is more widespread, however in North America the demand is higher than the supply. There is a strong market close to us, also due to the fact that the Kapuskasing mine will soon close. We strongly believe the next big play will be phosphate," said Bernard Lapointe, CEO, Arianne Resources.

On top of having titanium contents whose value is still to be analyzed, Lac à Paul has indicated resources of 78.3 million mt at 7.24% P₂O₅, and inferred resources of 260.2 million mt at 5.7%. Assuming the sale price will be C\$118/mt the scoping study establishes an internal rate of return of 20.8%. The capex is expected to be C\$325 million for a 13-year mine life and annual production of 2 million mt of concentrate.

Another figure to be considered is the concentration rate, said Nadège Tollari, Arianne Resources' vice president of research and development. "We would have a final product with a concentration of 39% P₂O₅. The market average now is 29%, probably increasing to 31% with new projects. Besides fertilizers, our concentrate could be used in human consumption applications, such as toothpaste, whitening products for food and also water treatment," she said.

Ideally, Lapointe would like to find an off-take partner in North America to mitigate transportation fees, however Asian players may also be interested. "Canada is the world's largest producer of potash and we have good production of nitrogen, but we also need to be self-sufficient in phosphate. Québec is a stable jurisdiction, plus there is a lot of water which is highly needed in the processing," he said.



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A New Day for Canada's Iron Ore

Ambitious expansion projects in the Labrador Trough area



ArcelorMittal Mines Canada is investing C\$2.1 billion to expand production capacity. (Photo: Mont Wright mine, courtesy of ArcelorMittal)

Fuelled by the increased urbanization and economic growth of Asia, the demand for iron ore is boosting investment opportunities in Canada's main ferrous district in the provinces of Québec and Newfoundland and Labrador. Many of the deposits currently being explored had already been known for decades, however it is only now that market dynamics are providing a strong incentive to push towards production.

"The current margins associated to the iron ore industry are unprecedented. This is following a 30- to 40-year period of marginal earnings due to market conditions and annual price contracts. It is a whole new day in the iron ore business. Now that we are moving increasingly towards a quarterly or spot transaction model, price is going to increase further," said Jeff Hussey, executive vice president of development for Champion Minerals.

The global financial markets may have their ups and downs, but the growth in real terms of the Asian economies (mainly China) seems unstoppable. "What is happening in China is something that has not taken place in the world since the industrial revolution. The country's steel production has increased from 127 million mt in 2000 to 627 million mt in 2010, and the growing trend continues because China's per capita income is still just \$4,000, so there is plenty of room for more growth. Plus, if this growth curve is replicated in India, the fundamentals of iron ore become phenomenal," said Sandy Chim, CEO of Century Iron Mines Corp.

In this context, production of iron ore from a safe supplier like Canada is poised to grow phenomenally in the years to come. Rio Tinto IOC is completing a three-phase

expansion program to increase production from 18 million mt of iron ore concentrate annually to 26 million mt by 2013. ArcelorMittal is expanding output from 14 million mt to 24 million mt by 2013. Meanwhile, U.S.-based Cliffs Natural Resources, who earlier this year spent US\$4.9 billion to acquire Consolidated Thompson, is doubling capacity at its Bloom Lake mine to 16 million mt with a plan to further increase to 24 million mt in 2016.

The Labrador Trough's producers

Rio Tinto owns 58.7% of the Iron Ore Co. of Canada (IOC), the rest belonging to the Mitsubishi Corp. (26.2%) and the Labrador Iron Ore Royalty Income Corp. (15.1%). The company employs 2,200 people and has been producing concentrate and pellets since the 1950s. Its large open-pit mine called Carol Lake is located near Labrador City, together with a concentrator and a pellet plant. Concentrate and pellets are taken



Sandy C.K. Chim, President and CEO, Century Iron Mines Corp.

to the Sept-Îles port in Québec through a common carrier, 418-km railway. On top of the expansion from 18 to 26 million mt of iron ore concentrate production, IOC is already carrying out studies in order to boost output to 50 million mt by 2016-17.

ArcelorMittal, the giant steel manufacturer, is also expanding at ArcelorMittal Mines Canada (previously Québec Cartier), its most important mining division worldwide, which comprises two mines: Mont Wright near Fermont, operating all year long, and Fire Lake, active a few months per year, as well as an industrial complex in Port Cartier that includes a pellet plant and a private port. The concentrate arrives in Port Cartier through a private 420-km railway. In May, the company announced a C\$2.1 billion investment to expand production capacity from 14 million mt to 24 million mt by 2013. As part of this scheme, the company is also evaluating doubling its pellets production from 9.2 million mt to 18.5 million mt.

"This expansion comes in line with our objective of reaching 100 million mt of iron ore production worldwide by 2015. This is a very cyclical industry, so the key to be sustainable is to have low costs. It does not matter if the long-term prices of iron are US\$60 or US\$70 as long as you keep your operations in the lower costs curve. It is difficult to predict if the 'Big Three' will maintain their position going forward, but in this business it is not about being the biggest, but about being the best. In Québec, we have a highly sophisticated workforce and a great resource of about 8 billion mt," said Peter Kukielski, head of Mining for ArcelorMittal.

ArcelorMittal Mines Canada currently employs more than 2,000 people in Québec. The expansion project will create 8,000 jobs during construction, and 900 new permanent jobs once it is completed. "We need to have excellent infrastructure to attract and keep our workforce. We will help provide health and education services such as kindergarten and day-care services. We are also discussing with universities and colleges to open offshoots in Fermont and Port Cartier, because the people from these areas want to stay in their communities. These are all important issues to work on. Another major one is housing," Kukielski said.

The third sizeable producer in the area is Cleveland-based Cliffs Natural Resources, with its 5.5 million mt/y Wabush mine in Labrador (concentrates are pelletized in Pointe Noire, Québec) and the Bloom Lake site in Fermont (Québec) of which it got hold of 75% via the acquisition of Consolidated Thompson (China's Wugan owns the rest).

Bloom Lake, which started production only last year and has been ramping up to reach its full production capacity of 8 million mt, is already being expanded to reach 16 million mt by 2013 through a two-phase, C\$650 million program to get what the company calls a 'mirror image' of the current operation.

The company's plans do not stop there. It intends to implement a similar investment immediately after that to expand production capacity to 24 million mt by 2016, for which Cliffs is already counting on its resources at Lamêlée and Pepler Lake, two exploration projects that currently stand at 935 million mt at 29.72% Fe (indicated). The railway used to ship production to Pointe Noire is a common-carrier, owned by Rio Tinto IOC.

The newest producer in the Labrador Trough is TSX-listed Labrador Iron Mines, who earlier this year started production at its Schefferville group of properties located in between Newfoundland and Labrador and Québec. The company is developing 20 direct shipping ore (DSO) deposits with average grades of over 55% Fe in an area that was exploited by IOC between the 1950s and 1980s. According to the current mine-plan, production is increasing from this year's 1.5 million mt to 5 million mt from 2015. With 39.5 million mt in measured and indicated resources (43-101), plus 125 million mt in historic resources, the company expects to be in production for more than 20 years.

Project pipeline

Like ArcelorMittal, other large steelmakers are seeing in Québec a great opportunity to further pursue their vertical integration. China's Wuhan Iron and Steel (WISCO), on top of having a strategic partnership with Century Iron Mines, a company with projects in the province, is also negotiating a joint venture with Adriana Resources at Lac Otelnuik for what, if it goes ahead, would be the largest mining project in Canada's history. Meanwhile Tata Steel has secured a partnership with New Millennium Iron Corp.

New Millennium Iron, formerly New Millennium Capital, is working on several fronts. On one side, there is the high-grade DSO project in Schefferville, where Tata has already taken a production decision for C\$300 million. As per the agreement, Tata Steel owns 80% of the project and will have to buy 100% of the production, with 20% of the amount (calculated at market prices) attributable to New Millennium. The project is already under construction and will yield 4.2 million mt per year annually over a 15-year period, with first production next year.

That, however, is meant to be just the start. The LabMag and Kémag deposits, with 43-101 compliant resources of 9.2 billion mt at 29%-30% Fe, are described by New Millennium Iron as the largest undeveloped magnetic taconite deposits in the world. With



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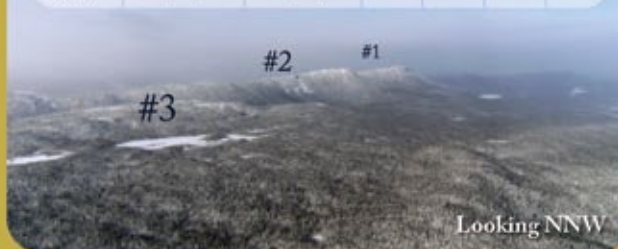


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Historical Geological Resources (Stratmat)

	SHORT TONS Fe		Fe	TiO ₂	Cr	Sio ₂
	Proven	Probable	%	%	%	%
Deposit 1	21,233,220	77,067,107	43.7	10.0	0.87	9.9
Deposit 2	203,872,733	694,231,557	43.7	10.6	1.55	6.6
Deposit 3	47,422,342	48,008,249	40.7	10.3	2.48	5.7
Deposit 4	nil	nil	42.8	10.6	1.11	8.6
Aggregate	272,528,300	819,306,913	42.7	10.5	1.66	6.7



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current data, expected production is 22 million mt/y of iron concentrate, 15 million of which would be pelletized. New Millennium has a binding agreement with Tata Steel, where subject to a positive production decision once the feasibility study is completed (in 2012-13), Tata would finance up to C\$4.85 billion to develop the project, while New Millennium would have a 20% equity-free carry interest and may acquire an additional 20%.

“LabMag has proven and probable reserves of 3.5 billion mt at 29.6% Fe for 46 years of mining. KéMag has 2.1 billion mt which would last 28 years. In addition, there are resources of 3.5 billion mt included in the two deposits, which are open to north and south. We expect that the Millennium Range could become the major iron ore mining area in North America. Geologically, it is identical to the Mesabi Range in the U.S.,” said Robert Martin, until very recently President and CEO of New Millennium Iron.

The preferred option for transportation to the coast seems to be a slurry pipeline. “The slurry pipeline has two potential routes,” said Martin. “One is 725 km entirely in the province of Québec. This follows an existing road for about half of its distance. The other is much more direct,

following an existing railway for 605 km through the two provinces.” If the project receives approval, it is expected to be in production in 2016.

In iron ore, infrastructure is everything. Adriana Resources’ massive Lac Otelnuk project, if developed could yield 50 million mt of iron ore per year for 75-100 years. The 43-101 resource is 6.45 billion mt at 29% Fe, plus sizeable historic resources. Located 160 km north of Schefferville in an area with no infrastructure, one can imagine the kind of expenditures that would be required to set such a project in motion.

“We are estimating that Lac Otelnuk will require between C\$8 and C\$9 billion. The total investment over a period of time, some of which will be funded by cash flow, will be in the order of C\$14 billion. We have to build an 800 km railway to Sept-Îles, which will cost C\$1.5 billion. The cars and locomotives will be another C\$1.1 billion. We will be shipping 1 million mt of concentrate in pelletized form per week. That means 40 trains per week and three ships per week,” said Allen Palmiere, President and CEO of Adriana Resources.

An investment of this size being beyond Adriana’s ability to fund by way of the capital markets, the company is negotiating a joint venture agreement with WISCO, with



Allen J. Palmiere, President and CEO, Adriana Resources

whom there is already a binding framework agreement in place. The idea is that Adriana will keep 36% of the project. Palmiere underlined the importance of the arrival of new players to the iron ore business. “The chairman of WISCO is on record as having stated that his objective is to be 100% independent of the Big Three within five years. Vale, BHP and Rio Tinto will not be thrilled by this development, but when you have 70% of the market you cannot be too concerned either. China alone imports more than 50 million mt per month.”

WISCO’s interest for Québec is not limited to Adriana Resources, of which it owns 19.9%. It also owns 25% of Century Iron Mines, a company that did its IPO earlier this year. WISCO also has a 40% JV interest on Century’s projects, an off-take agreement for 60% of future production (20% at market prices) and will provide debt financing for 70% of the capital expenditures required to achieve production. Another company from China, MinMetals, has a 5% stake in Century Iron Mines and an off-take agreement in place for 10% of production at market prices. “Exploration on our three projects, with WISCO’s C\$120 million plus the C\$115 million we raised in the markets, is fully funded all the way to feasibility,” said Chim.

Century’s most advanced project is not located in the Labrador Trough, but in the James Bay area. Called Duncan Lake, it has 43-101 compliant resources of 852 million mt (all categories) with grades in the 23-24% Fe range. Century is currently increasing its stake in the project from 51% to 65%, the rest being with Augyva Mining Resources. “Duncan Lake is an excellent magnetite project in the middle of well-established infrastructure, in the top 10 worldwide for hydropower facilities. We are close to roads, airport and the town of Radisson, plus we are only 120 km away from the water,” said Chim.

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"Magnetite in Australia does not have a high enough grade to be commercially shippable without concentration. Western Australia is a desert and water from desalination is very expensive. By contrast, a magnetite deposit in Canada is a blessing due to the availability of water. Québec has around 1 million lakes," said Chim.

With regard to the Labrador Trough, Century is evaluating the taconite and DSO potential in the area of Schefferville. Projects are called Attikamagen (where it is earning a 60% stake from Champion Minerals) and Sunny Lake.

Toronto-based Champion Minerals is another company building up its iron ore resource in the Labrador Trough. While Century Iron mines spends C\$13 million at Attikamagen as per the agreement between the two companies, Champion is concentrating its efforts further south at its 82.5% owned Fermont holdings, with a 43-101 resource of 1.5 billion mt at 25.4% Fe.

"Mineralization in the Fermont camp is coarser-grained in nature; all of the producers are there because it is easier to liberate the iron from the gangue minerals. Approximately 50 km north of Labrador City, the Labrador Trough transitions into very fine-grained taconite. This is partially

the reason why the project costs are lower in the southern portion of the Labrador Trough with additional benefit due to its proximity to the Saint Lawrence Seaway," said Jeff Hussey of Champion Minerals.

Within the Fermont properties, the company is updating the preliminary economic assessment at Fire Lake North (where it has nearly trebled its resource to reach 400 million mt at 30.6% Fe M+I and 661 million mt at 27.7% Fe inferred, cut-off grade 15%) to also include the Bellechasse area (215 million mt at 29% Fe). Other areas of focus are Harvey Tuttle (947 million mt at 23.2% Fe), Moire Lake and O'Keefe Purdy.

The 2011 budget in the area has been nearly C\$35 million for 60,000 meters of drilling (C\$6 million of which contributed by JV partner Fancamp Exploration).

"The focus is on Fire Lake North. The initial PEA illustrated that the project was viable with a net present value (NPV) of C\$1.6 billion at a cash flow discount rate of 5%, based on an iron ore concentrate production rate of 7 million mt/y at a grade of 65% Fe. A price assumption of US\$81.4/mt of concentrate was used with an in-pit resource of 250 million mt. The capex was estimated at C\$890 million including a 20% contingency," Hussey said.

Other companies exploring for iron in Québec include Oceanic Iron Ore, with projects at the very northern end of the Labrador Trough, in the Ungava Bay area; and Fancamp Exploration, which besides funding its share in the development of the Fermont area together with Champion, is drilling its 100%-owned Lac Lamêlée project.

"The property was never previously drilled, but has a magnetic signature similar to Cliffs' Lac Lamêlée Deposit some four kilometres to the north," said Peter Smith, President, Fancamp Exploration. Fancamp also holds a 48.7% interest in private company Magpie Mines, working on the Magpie titaniferous magnetite deposits with historic resources of 1 billion mt at 43% Fe and 11% TiO₂. The idea is to validate this resource under 43-101 standards so as to proceed with an IPO. The Plan Nord will be a key catalyst to all of these iron ore developments, marked by large volumes and tough logistics.

"In 10 years time, Canada could be producing well in excess of 100 mt/y of iron ore. However, the country will need significant infrastructure investments in order to continue expanding to this level," said Martin.

"Our little Western Australia has to be developed and for that we need the rail," said Hussey.



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Helping Québec's exploration business survive the low cycles

In recent years Québec's mining sector has found a great ally in institutional investors, some of which have clear mandates to promote the growth of the industry within the provincial boundaries. This enables exploration players and even service providers active in Québec to be eligible for financing. The FTQ Solidarity Fund, Sidex, Sodémex and other smaller regional funds are good examples of this institutional support.

"It was created in 1983 by the Québec Federation of Labor, the biggest union in the province, which was a bit of an eccentric thing to do from a union perspective. The initial objective was to raise C\$300 million, which the press considered a joke, they thought that was impossible. 28 years later, our assets are about C\$7.7 billion. We are the largest venture development fund in Canada and we have a unique model, with 500,000 shareholders. One of our philosophies is to create jobs," said FTQ Solidarity Fund vice president of Investments Gaétan Morin.

"We invest in projects with great potential and managed by people with good expertise. In 2002, just after the Bre-X scandal, we put C\$100,000 in Osisko to help them survive. We also invested C\$30 million at the development stage. Today it is a multi-billion dollar company. Another success case for us is Aurizon: nobody wanted to finance them back in the 1990s and today they have hundreds of employees," said Danny Pelletier, director of investments in natural resources for the FTQ fund.

As well as mining and exploration companies, the FTQ Fund also invests in service providers like Technosub, a manufacturer of pumps for mining operations based in Rouyn-Noranda.

In 2002, the Québec government and the FTQ Solidarity fund joined forces to create a new, separate fund called Sidex, with a clear mandate to diversify the exploration business in the province. "In 2001, we were active in two main commodities, iron ore and gold, and both were going

through low periods back then. People were abandoning the mining industry, and once workers leave, it is very difficult to get them back. These are very specific jobs, so training new people is very costly. The idea was that this should not happen again," said Michel Champagne, CEO of Sidex.

The C\$50 million that initially formed Sidex's fund have allowed for an outstanding investment portfolio in the junior sector, promoting exploration in previously untouched territories and helping discoveries in new commodities like lithium, uranium, rare earths, niobium and tantalum. "In these 10 years we have never lacked money for financing projects. We typically do financings between C\$100,000 and C\$1 million, although occasionally we go over that. We have already done 200 financings out of 450 requests received. We are constantly looking for new projects, with the condition that all the money that we provide has to be spent on the ground," said Champagne, who pointed at

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Denis Landry, President, Gestion Sodémex

Stornoway Diamond Corp. and Canadian Royalties as some of the successful placements done by his team.

Another mining fund with a Québec-focus is Sodémex, a C\$100-million joint venture between Soquem, the exploration arm of the Québec government, and the Caisse de dépôt et placement du Québec, a very large investment fund. The aim of Sodémex is to invest in promising exploration projects, although it also has stakes in a number of gold producers.

"We do not hesitate to sell when necessary because we have to bring profitability to our shareholders. We have about 60 companies in our portfolio, and everyday we can do transactions in 25-30 companies. Over our 14 years of existence, we have returned more money than we were initially given to start the fund, plus we still have C\$100 million out there," said Denis Landry, President of Gestion Sodémex. Landry underlined that Sodémex never goes over 10% of a company's shares, but there are about 10 companies where the fund owns between 8% and 10%, which makes it a major shareholder. "One of the biggest success stories was Virginia Mines, whereby we became shareholders of Goldcorp with an excellent financial performance," he said.

In an increasingly active exploration market, and with the atomized nature of the junior segment (in Québec alone there are approximately 300 active junior players), it is difficult to determine which companies will stand out and be successful. "We are very strict in the way we choose our investments; on top of the geological potential, companies need good management teams in order to be successful," said Landry.

According to Champagne, social acceptability was not an area of focus for the mining sector a few years ago. "We are putting more and more emphasis on social acceptability. We ask all companies that we finance to put in place a plan to engage

in sound community relations and environmental care. We have been insisting on this over the last few years."

Pelletier of the FTQ Solidarity Fund also stressed the role that these funds can have, not only as investors, but as advisers. "We do not just invest in companies; we also bring a different view from an outsider point of view and help players open their eyes about what is going on in the general environment. In this context, sustainability is key," he said.

Spin-offs galore

Post-crisis, the exploration business is taking off again, but that does not mean that raising money is an easy task. The funds available for risk exploration are not unlimited, and the number of juniors continues to grow, fighting for these same funds. While not that long ago juniors were comfortable working in several commodities and geographic locations under the same company structure, claiming it was good to be 'risk-diversified,' today the trend is to spin out any asset of value that may not fit within the company's core business and create one, or several, separate listed companies.

In other words, if you are a gold player you should spin out your lithium asset; and if you are Québec-focused explorer you

should create another company for your African projects. The rationale behind this is to unlock the value of all the promising properties a company may have, even if their separate values may be modest, in a market where investors are increasingly sophisticated.

"During the financial crisis, a lot of companies accumulated assets and when stocks started to rebound there was a boom in spin-offs. Spin-offs create a lot of work for us in terms of corporate transactions, regulatory approvals and tax issues, even though these are not transactions worth millions of dollars," said Frank Mariage, partner at Miller Thomson law firm in Montréal.

The result is the increased fragmentation of an already atomized segment, which raises a number of questions: will there be funds for everyone? Will there be geologists to run all these projects as the market is struggling to find specialists? In parallel to the spin-offs trend, junior companies are increasingly signing joint venture agreements with other juniors or producers for the simple reason that they cannot cope with all of the work with the people and funds they have. "The source for financing has remained the same, while the number of companies has increased, so it is more difficult to distin-

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Dany Pelletier, investment director natural resources, and Gaétan Morin, vice president of investments, FTQ Solidarity Fund. (Photo courtesy of Jean-Sébastien Cossette)

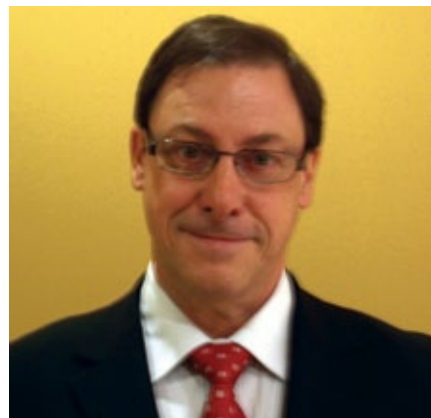
guish yourself from other companies. We will see a phase of the consolidation as there are too many players," said Antoine Fournier, vice president of exploration and COO, Threegold Resources.

Surviving the low cycles

Raising funds is frequently a major headache for junior companies, especially at times of depressed metal prices. "I have been in the junior business all my life and it has always been tough to raise money. When you see the general market rising, the junior market falls, and when you see the general market falling, you see the junior market collapsing.

The crisis wiped out 90% of our value almost overnight. We had to issue many shares to stay ahead of the drill rig. This is where Sidex and the FTQ Fund helped us do financing, at rates that were double the market valuation of the time. They had faith in us, and we are very fortunate to have such strong supporters," said David Patterson, chairman of Donner Metals.

On top of having these institutional investors closely following all juniors present in the province, Québec offers other advantages, such as the federal super flow-through shares scheme, which allow investors to deduct expenses on their acquisition,



Michel Champagne, CEO, Sidex

and an additional tax rebate that in Québec is up to 150% of the exploration expenditures; putting it simply, for every dollar spent on the ground, you can get up to 50 cents back – cash.

These incentives look at extending the life of the industry toward the future, no matter the cycles. "Today everyone wants to be in the mining industry, but a few years ago it was a very different story. We need to invest in exploration because otherwise we will not have new mining companies in the future," said Danny Pelletier, FTQ Solidarity Fund.

Jean M. Gagné, partner at Fasken Martineau DuMoulin law firm in Montréal, said companies with projects in Québec have an advantage they cannot get in many other jurisdictions. "The mining sector in Québec gets the support of a number of financial institutions. That is an important aspect to the way the industry has evolved, and you do not have that elsewhere in the country. In the recent provincial budget, the finance minister indicated that in Northern Québec, he would create a fund for equity investments in exploration companies on the territory. The province is really proactive," he said.

Junior companies are important beneficiaries of this trend. "Montréal is a very sophisticated investor's base: you have fairly major financial institutions willing to look at junior exploration. In British Columbia there are risk investors, but in Montréal they are looking at the future of the province and want to encourage investment in Québec," said Bradley Kitchen, President and CEO of Vancouver-based Eagle-Hill Exploration.

Undoubtedly many jurisdictions around the world have a lot of potential, but in terms of offering regulatory incentives for exploration and strong institutional support, all of them would struggle to compete with Québec.

A promotional graphic for Sidex. At the top left is the "SIDEX" logo in a bold, sans-serif font, with a stylized blue and green 'X'. Below the logo, the text reads: "Financing is available to any publicly listed company with a promising exploration project in Québec". At the bottom left, contact information is provided: "Contact us: Tel. (514) 383-2612 www.sidex.ca". The background features a satellite-style map of Québec, Canada, with a color-coded overlay indicating exploration potential or geological data.



(Photo courtesy of Osisko)

Québec offers an array of consultancy companies that can assist from exploration to processing and mine closure.

The new impulse towards gold and iron ore thanks to high commodity prices, the discovery of deposits in new minerals, the need for brand new infrastructure (especially in the north) and tighter environmental standards are just some of the factors promoting the business of engineering consultants in Québec. While some of the companies have been in the province for decades, the demand is such that new players are entering the market, either coming from abroad or building up their mining expertise in their existing offices.

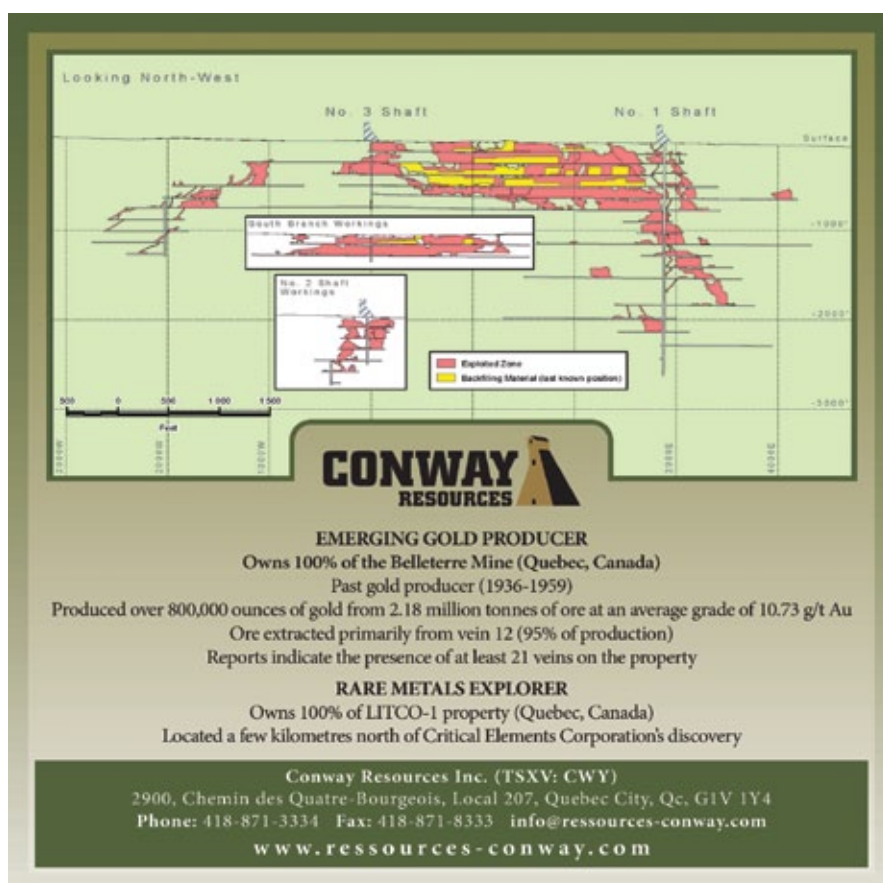
AMEC, a company whose roots are linked to Québec through the creation of Montréal Engineering Co. (Monenco) in 1907, decided to re-open in the province four years ago, with a mandate to start building up its earth and environmental presence and also do infrastructure work. The company now has 85 people in Québec.



Luciano Piciacchia, vice president Québec, AMEC

"We offer environmental services such as impact assessments and baseline studies. It is essential that environmental aspects are incorporated from the design phase. As we move into the engineering and geotechnical, we can design the tailings facilities, trying to reach optimization and minimize the environmental impact. Then we go and build these for the client. Also, we help them at

the other end of the spectrum, when they need to close the mine, so it is a cradle to grave type of approach. We also help clients with infrastructure, including some fairly complex geotechnical issues, in rail lines for instance. We do some work with juniors, but a lot of our clients are established mining companies that are looking for expansions due to the high price of commodities,





Pointe Noire stacker/reclaimer, operated by Cliffs. (Photo courtesy of CIMA+)

and this results in more design mandates,” said Luciano Piciacchia, vice president Québec, AMEC.

To better serve the iron ore segment, AMEC opened an office in Wabush (Newfoundland and Labrador) last year.

Genivar and Golder Associates are two other companies with a strong environmental practice. In the case of Golder, the company has 2,800 employees across Canada and six offices in Québec. Among other areas, Golder focuses on mine waste management, mine planning, rock mechanics and environmental impact assessments, as well as ore reserves evaluation.

“We have been fortunate to be associated with very significant projects in Québec, like Agnico-Eagle’s LaRonde mine, for who we have been working for more than 20 years. In 1990 they were not a big company; we take lots of pride in helping clients get their projects to completion,” said Michel Julien, principal at Golder Associates in Montréal.

According to Julien, Golder’s strategy was progressively moving “from giving services to providing solutions” and gave his vision about waste management. “Waste management needs to be driven by two things: rigor and innovation. The engineered

solution needs to contain the waste for the long term and resist the tests of time. Realistically, we cannot accept the perpetual treatment of effluents as a way forwards. If you fly over Northern Canada, you will see lakes all over the place. We are always dealing with surface water and this is extremely complicated. It is even more challenging when you move up north because the environment is so pristine there,” he said.

Genivar, a rapidly-growing Québec firm with 5,000 people (mainly in Canada) and listed on the TSX, serves the mining industry in environmental and infrastructure services, while also getting involved in geology and pre-feasibility and feasibility studies. Within the environmental field, mine closure is one of the company’s strengths (the company claims credit for what it describes as the largest mine closure plan in Canada at Selbaie for BHP Billiton). Genivar can also do EPCMs in the C\$400-\$800 million range; its processing experience is mainly in precious metals so far.

As social acceptance becomes a core part of any project, Genivar’s vice president for environment, André-Martin Bouchard, said consultancies can offer new solutions to clients. “We have a very powerful 3-D tool, quite unique in the industry, to optimize the project and assess the real envi-



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ronmental impacts. There are many issues of which we only become aware by looking at the 3-D models developed by our team; things such as the noise generated by an operation and how it decreases as the pit becomes deeper. A picture is worth 1,000 words and these models really help people understand how mining operates.”

Like AMEC, SNC-Lavalin was first established in Montréal and is celebrating its hundredth anniversary this year. A global company employing 24,000 people worldwide (4,000 in mining and metals), it has doubled its M&M presence in Québec in the last three years to reach about 700 people. An important part of this is aluminum (the province has significant producers like Rio Tinto Alcan, Alcoa and Alouette), but also mining, where it has a strategic alliance with ArcelorMittal for iron ore, and with BHP Billiton for potash.

“Companies are realizing there is going to be a shortage of resources over the next years so they are trying to secure agreements with engineering firms to get the support they are going to need,” said Claude Létourneau, senior vice president M&M and global leader for iron ore and aluminum, SNC-Lavalin.

On top of mining and processing, SNC-Lavalin is involved in infrastructure and environmental work as well.



Steve Fiset, President and CEO, BBA

Another company with a sizeable office in Montréal and significant process expertise is Hatch, which counts 9,000 people in 61 offices worldwide and has in Québec its center of excellence for titanium dioxide and aluminum refining; iron ore being the third important leg for the company in the province. “We have enough diversity so that if something happens in the mining industry, the bottom does not fall out of our business. We have always had a strong level of activity in the refinery side. Metallurgical processing in Québec is as big as the mining business, both in terms of the wealth that it generates and the jobs it creates,” said

Rob Metka, managing director responsible for Québec, Hatch.

Metka is optimistic about the growing trends of the mining industry worldwide and in Québec as global demand for commodities is moving upwards. “There will be many opportunities for companies to exploit reserves previously deemed uneconomical as a result of the product price. You might see a lot of tailings that will now be reserves, and I suspect there are a lot of materials that with today’s technology will become economic. Also, I think that Québec holds enormous potential for deeper, richer ore bodies,” he said.

Optimizing processes

Thanks to the extensive expertise of the province in mining and metals production (notably gold, iron ore and aluminum), Québec has developed an edge in engineering and process expertise. The proactive approach of the government and the existence of an organization like COREM, a non-for-profit research consortium participated by the industry, help promote innovation in a sector that is traditionally highly conservative.

COREM, formerly a governmental body, has twelve companies, two universities and the provincial government as members. It has a budget of C\$12 million per year, a re-



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MINING IN QUÉBEC

search plant of 53,000 square feet in Québec-city and it employs 130 people, including 35 engineers and 50 technicians. "We are the largest group of scientists totally dedicated to mineral processing in Canada and one of the biggest in the world," said Yves Harvey, executive director of COREM.

Serving mostly established producers with operational processing plants, the consortium is also available for research for non-member companies including juniors. "Our core activity is the pre-competitive research program, which represents about 50% of our business. Pre-competitive research is funded collectively and its results are accessible to all members. At any time we have 30 ongoing research projects. Half of our business is in the iron ore sector, which is very important in Québec," Harvey said.

COREM's six main fields of research are fragmentation, physical separation, flotation, extractive metallurgy, pelletizing and thermal processes.

"This is quite a unique research model. Being a shared research facility, members benefit from lower costs, as funding all this research on their own would be expensive. The members have an exclusive right over intellectual property for five years. We receive ores from all over the world, especially on the iron ore side," Harvey said.

Medium-sized consultancies

On top of the engineering multi-nationals, Québec offers a number of competitive medium-sized players who are nevertheless growing fast. BBA and Cegertec have a headcount in the hundreds already, whereas smaller companies like Met-Chem (owned by U.S. Steel) and Seneca (specialized in processes) also play an important role in engineering and technical consultancy services.

BBA, a company created in 1979 in Mont-Saint-Hilaire (Québec) as an electrical engineering company, incorporated a process group seven years ago and currently has 625 employees and three offices in Québec. The company prides itself on the fact that some of the initial clients from 1979 are still working with BBA 32 years later, and that it has participated in the design of big open-pits recently, including Osisko's Canadian Malartic, Consolidated Thompson (now Cliffs)' iron ore mine and the Detour Lake project in Ontario.

"When you differentiate yourself in the value of your technical services it is very important to be there early on in the project. We do not do the geology per se, but we take it from there, through scoping to engineering, including the environmental definition of the project. Then, we are strong in

the metallurgical part; we have a team of twenty metallurgists and process engineers. We are well known in gold and iron ore. Consolidated Thompson's mine was the first iron ore operation built in eastern Canada since the 1970s so we were privileged to work there," said André Allaire, director of mining and metals at BBA.

The question is, how can a medium-sized company manage a 20% a year growth rate without acquiring the faults of very large companies? "The secret is exporting this business model to other parts of the world. We want to repeat our success of Eastern Canada in other regions; this is why we opened an office in Vancouver. We are not going to serve the world from Montréal. 50% of our work is actually on small projects in ongoing operating plants. It is very important to be close to our customers and assist them in the long run," said Steeve Fiset, President and CEO, BBA.

Cegertec, another firm that does a lot of plant engineering and maintenance, also needs to be located close to its customers rather than do remote engineering. The company has more than 400 employees and its area of focus is the east of the province where iron ore producers are. Clients include Rio Tinto IOC and ArcelorMittal, with whom they have recently



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closed a five-year partnership. "We are not a billion dollar project company, we are focused on providing local support. We focus on adding repeat business with clients more than working in larger projects. Our competitive advantage is that in addition to energy, we have a lot of infrastructure, transportation and building services," said Stéphane Leduc, vice president and CEO of Cegertec.

Meanwhile Met-Chem is also involved in a good number of projects across the mining spectrum in Québec. The Montréal-based firm has more than 100 people between staff and consultants and is mainly involved in geology, mining and process, although it wants to grow organically into more environmental, power and infrastructure work for the mining sector.

Guy Noiseux, Met-Chem's general manager of corporate development, saw a big bump on the road. "With all the requests we receive, we now hold a weekly meeting to decide which clients we have to decline. Resources are the big issue: only in iron ore, if all the projects go ahead as announced, the stress in the market will be immense. There is a missing generation, and now we are facing the backlash," he said.

How can the industry deal with the shortage of skilled people? The mining sector is an increasingly attractive industry to work for, said Piciacchia. "Above and beyond, what attracts people is the sheer size of some of these mining projects. In the cities, you will not find projects of this size." However competition among the different firms is intense.

According to Fiset, these specialized consultancies need good engineering skills, but also people who can manage projects. "Finding people is one thing, finding good people is another. The office needs to offer an environment where new ideas can be put on the table. We reward creativity and technical capabilities as well as management skills," he said.

Although partial, there are some solutions to this. Noiseux said people need to work for longer. "For seniors, it is not the time to take their retirement."

Metka advocated for more recruitment overseas and praised the training of engineers in other countries like Russia.

The First Nations need to continue increasing their participation in the sector, and some of the firms are facilitating this development with the creation of joint venture companies. Just as an example AECOM, a large engineering firm, has an environmental company jointly-owned with the Cree called Kawashekami.



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Stephen Dawson, President – Americas region minerals and metals, Ausenco

More players in the mining market

The new boost the mining sector has had in recent years and the associated demand for engineering services has attracted new engineering players to Québec's mining sector. Australian Ausenco, who entered the Americas in 2008 with the acquisition of Vector Engineering, PSI and Sandwell, transformed the existing Montréal pulp and paper office into a mining and metals practice. This transition was similar for CIMA+, a company with a longstanding presence in Québec. AECOM, a very large American firm, made two significant acquisitions



Québec has significant underground expertise. (Photo courtesy of Aurizon Mines)

(Tecsult and RSW) to strengthen its position in Eastern Canada (RSW had mining expertise in exploration and feasibility studies).

Roche, a firm with extensive experience in Québec and 1,600 employees, created a mining-dedicated division last year.

DRA Americas, a company originally from South Africa, is trying to develop its business in the region with an office in Toronto and a focus on medium-sized mining clients.

Being the new kids on the block, success is not an overnight thing, said Stephen Dawson, President of Ausenco's M&M division in the Americas. "Ausenco

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Ausenco M&M now has 150 people in Canada with significant process expertise. The company recently won its first full EPCM in the country, the C\$300 million Gibraltar project for Taseko Mines in British Columbia, and Dawson is convinced that Canada will be an important revenue

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center for Ausenco in the medium term. "If we had more people in the office, we would have loads more work. So far in Canada we have concentrated on gold and copper, but here we want to be present in all the commodities in Northern Québec. Our Western Australia office is very strong in iron ore so we can import that expertise as well. Our advantage is our process expertise across the group and the fact that we are an alternative to clients; we may offer potentially a different perspective on projects, with our baggage of developing low-cost gold projects for junior companies in Australia. We can bring some innovative approaches to project delivery," Dawson said.

CIMA+ is another firm who 'recycled' its pulp and paper expertise to serve mining. The company has 20 offices across Québec, plus a presence in other Canadian provinces as well as internationally, for a total of 1,800 people, 150 of which are dedicated full-time to the expansion of the Bloom Lake iron mine.

"In 2008, as everybody was focused on gold in the Abitibi region, the iron sector of the north shore remained open. We started out with a small bulk conveying project using in house expertise transferred from the pulp and paper sector. We then added expertise from all the other sectors, covering

roads, bridges, rail, maritime and energy. This allowed us to tackle a mining project with a 360-degree vision," said Jacques Tremblay, associate and project manager at CIMA+.

"In any job you need to cover design, maintenance, safety, operations and environmental issues. We do not want to do a project and then go away; we want to build a solid group and bring our maintenance engineers to work with the client in the long run," said Tremblay.

To achieve that, Tremblay stressed the importance of a good working environment for employees. "CIMA+ promotes an organizational structure with a current ratio of about one partner to 14 employees in each field. This structure is an unusual feature that gives us a unique ability to provide our customers with personalized service: we can turn on a dime," he said.

Other important players increasingly targeting the mining industry are Roche and AECOM. The latter is a large multinational with presence in 100 countries and 1,500 people in Eastern Canada.

The firm has significant mining and process expertise in Australia, and is building up its working capacity in Québec where it has traditionally been a strong player in hydropower.



Wray Carvelas, CEO, DRA Americas

"We designed and managed the construction of the railway project for Consolidated Thompson successfully during the winter time in Labrador. This year we have won a contract with Tata Steel to design their new DSO mine. The project has been awarded to AECOM thanks to the global synergies created in our organization: the mining expertise in Australia and elsewhere in Canada, our procurement capacity in China, and the project and construction management here," said Pierre Asselin, executive vice president for Canada East at AECOM.



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Engineering Québec's golden success. (Photo courtesy of Osisko)

AECOM's plan is to have 50 to 100 people dedicated exclusively to mining in its Montréal office over the next couple of years.

While Ausenco has arrived all the way from Australia, another recent arrival from the southern hemisphere is DRA of South Africa, a firm with 2,500 employees worldwide and with a strong process

background, while it also takes care of the mining and infrastructure sides of the business.

DRA works in the region as DRA Americas, and as it builds up its presence in the continent, it is concentrating mostly on process for medium-sized projects.

"Local knowledge is very important. We have learnt that you cannot go to a new

country and do things as you do them in South Africa; for instance here you have extreme cold weather. This is why we have partnerships with local engineering firms and consultants. On the other hand, we will not hire substandard engineers just because we have a project to attend. We are only as good as the engineers that we employ," said Wray Carvelas, CEO, DRA Americas.

While DRA already has experience in Canada through diamond projects developed for De Beers, one of the first successes of DRA Americas is the iron (DSO) project for Labrador Iron Mines in the Labrador Trough.

"We managed to build the 400 mt/h plant very quickly with a hands-on approach towards project implementation. The design of the plant was really tailor-made which improved cost efficiency. We are particularly good at building projects on a fast-track basis. At the beginning, our company specialized in modular-type plants that allowed juniors to get into production very quickly," Carvelas said.

As business gets rolling in North America, DRA is also looking to expand in South America, opening up an office in Lima and with plans to set up branches in Brazil and Chile as well.

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Geophysics is targeting deeper exploration. (Photo: Fugro's Megatem system, courtesy of Fugro Airborne Surveys)

On top of great geological expertise and renowned drillers, Québec also has highly-experienced mining contractors and a strong industrial base to provide locally-manufactured equipment.

Geophysics

From early-exploration geophysics jobs to drilling campaigns and the compilation of 43-101 reports, exploration companies have all they need nearby. In airborne geophysics, for instance, there are players like Fugro (serving Québec from its Ottawa and Toronto bases) and GPR Geophysics, with its HQ near Montréal.

Fugro Airborne Surveys' Ottawa office has 70 people and owns seven aircraft, while the Toronto branch focuses on helicopter operations. The company was seriously affected by the 2009 financial crisis as exploration dollars decreased by 40%, but activity is finally picking up again this year. The company offers airborne electromagnetics, gravity, magnetics and radiometric techniques.

"Fugro and its predecessor companies have been in Québec since the 1960s with electromagnetic technology operated in large aircrafts. 10 or 15 years ago it became apparent that these systems had limited reach. This is how Fugro's predecessor company developed the Megatem II system. One of our latest introductions has been the Falcon airborne gravity gradiometer system, which measures the gradient of the gravitational field and the variations caused by different densities in the ground. It is a good system to look for iron ore," said Terry McConnell, managing director of Fugro Airborne Surveys.

Gorge Nader, director of global technology development at Fugro, believes R&D will result in more effective exploration techniques (with electromagnetics that could reach depths of 500 m or more in the Abitibi) as well as increased safety standards. "We commenced research into unmanned airborne vehicles (UAVs) five years ago, and while the technology was not as reliable at

that time, recent improvements in platform designs indicate that this technology could be viable in the not too distant future," he said.

After airborne surveys are done, clients may choose to narrow the choice of targets using ground geophysics. Abitibi Geophysics, based out of Val-d'Or, offers ground and bore-hole geophysics, often to compa-

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panies that want to find new reserves in areas already being exploited. The company's in-house developed InfiniTEM system can detect mineralization up to 1,000 m depth.

"Ground geophysics is very effective in mature areas. More than 50% of the InfiniTEM projects are in major mining camps, where the geological environment is favorable and companies want to explore deeper near profitable deposits. InfiniTEM developments will improve detection of base metals like copper, nickel and zinc when they occur as conductive massive sulphides and graphitic horizons associated with non-conformity uranium deposits. For gold exploration we have developed other techniques such as Hole-to-Hole 3D Induced Polarization (H2H-3D-IP) that will detect disseminated grains of sulphides. Gold is much more difficult to find as it may be economic at 1 ppm," said Pierre Bérubé, President of Abitibi Geophysics.

Exploratory drilling

Québec offers what are probably the lowest drilling costs worldwide. Expertise in this field has been exported around the globe for many years now. Some companies founded by Quebecers actually started in other countries; that is the case of Val-d'Or-based G4 drilling, whose first job was for Agnico-Eagle at their Pinos Altos project in Mexico. Today the company has 20 rigs in Mexico and 11 in Canada, offering both diamond and reverse circulation drilling.

"Our plan in Canada is to reach 20 rigs and have a similar size to our operation in Mexico. Then, we are planning to place seven or eight rigs in a third country by the end of 2012," said Daniel Gamache, President and CEO of G4 Drilling (Forage G4 in French).

Gamache assured that G4 has good expertise in difficult-to-drill locations (the company was the first contractor to drill in the Ungava Bay area this year in the extreme north of the province). He insisted that drilling in Québec has evolved to increase productivity and improve safety standards, but pointed out that the current market frenzy does not allow contractors to sit down and bring major innovations. "We want to keep a relationship with our clients for the long term. However, in the current market, it is very difficult to stop growing. In five years we have gone from four to 220 employees. The challenge is to manage growth."

The company sources all of its machines in the Val-d'Or area. "Quality is important, but when there is high demand for rigs, drillers and technicians worldwide, just as important is service. This is why most of

the contractors here use local manufacturers," Gamache said.

Due to the high demand for rigs in the province, big contractors like Major Drilling and Orbit Garant also have bases in Val-d'Or. Major Drilling has boosted its presence in the region by acquiring family-owned Bradley Group, based in Rouyn-Noranda, for C\$80 million. At the time of the acquisition Bradley had 124 rigs and 70% of its revenue came from Eastern Canada. In a recent press release, Major highlighted that the acquisition would add 'new geographic footprints in Northern Québec and Northern Ontario' where Major had been less present.

A very important drilling contractor in Québec is TSX-listed Orbit Garant, which has 180 rigs and headquarters in Val-d'Or. The company manufactures its own machines and has traditionally focused on its natural area of influence (87% of its revenue comes from Canada). "Most of our machines have been built at our subsidiary in Soudure Royale. We have the capacity to build 75-100 rigs/year, which gives us a cost advantage of 50%. Moreover, the machines are adapted to the needs of both the client and the operator," said Eric Alexandre, President and CEO.

Orbit Garant expects to close the year with 1.3/1.4 million meters drilled, roughly 40% of which comes from underground projects. The company has close to 900 employees and its own training school in collaboration with the Val-d'Or school board.

Exploration consultancies

Exploration juniors, very often companies with minimum staff, need assistance from consultancies that will manage drilling programs, take care of logistics, supervise geochemical analyses and finally write the famous 43-101 technical reports. Val-d'Or being an exploration center, there are a number of companies that often get together and collaborate to provide a turnkey solution to the client. Players include Innov-Explo, MRB & Associates and Consul-Teck.

InnovExplo, a company created in 2003, has 45 employees today including 18 geologists, and is also growing in the field of engineering. The company does resource and reserve estimates, scoping studies and pre-feasibility studies.

"We have three types of clients: producers like Agnico-Eagle, Goldcorp and Iamgold; junior companies, for which we mostly do independent technical reports; and finally the third type of client, which is new in the last four years, is investment funds and market authorities that ask us to review the technical reports done by other



Alain Carrier and Carl Pelletier, directors and consulting geologists at Val-d'Or-based InnovExplo

consultants. Sometimes there are acquisitions in the marketplace and the due diligence needs to be done very quickly," said Alain Carrier, director and consulting geologist, InnovExplo.

As the market witnesses a shortage of geologists, InnovExplo is increasingly targeting European skills, explained Carl Pelletier, director and consulting geologist. "People from Europe are highly qualified, but there is virtually no mining activity there. They speak French and Québec is just the perfect school. They have the option to go to Africa, but to go to Africa you need some experience beforehand."

InnovExplo, who has followed clients like Agnico-Eagle and Goldcorp to do jobs in other countries like Finland, Mexico, Argentina and Peru, is building up its engineering capacity in parallel to the changes in the 43-101 regulations.

"The previous 43-101 format included just one engineering item, as opposed to 23 geology items. Now you need to include eight engineering aspects. Even at the resource stage, we are going to need the input of the engineer; for example to establish the cut-off grade to define the resource. Equally, in the reports at the engineering stage you will need the input from the geologist

to do a resource validation before doing any economic assessment such as the feasibility study. The responsibility of the qualified person becomes greater under the new format," said Carrier. InnovExplo already has three mining engineers and two technicians specialized in mine design.

Jean-Sébastien Lavallée, vice president of Consul-Teck, a firm that supports clients through exploration campaigns and provides logistics solutions in remote areas, further explained the modifications to the 43-101 system. "The main difference on the resource side is that you need to justify the cut-off grade: you cannot include a resource that in reality you would not be able to extract. Currently a 43-101 report can take about three months to be completed, the new regulations may make this time frame longer," he said. "There is a big flaw in 43-101 as the Exchange is not qualified to verify the resource calculation since they do not have the appropriate software. Current changes are aimed at standardizing the way that companies divulge their information through press releases. Things are moving in the right direction," said Martin Bourgoin, president of MRB & Associates, a firm with a focus on technical reports and the management of exploration campaigns, with significant experience in iron ore.

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Construction and mine development

Once production decisions are taken, and following the engineering work, contractors come in to set up the needed infrastructure and build up the mine facilities. These jobs are labor-intensive and some of the construction companies hired by the mining clients stay over the lifetime of the operation.

Omaha-based Kiewit, one of the United States' largest contractors with 26,000 employees and revenues of US\$10 billion in 2010, is very active in the mining sector in Eastern Canada.

Over the last years it has strengthened its presence in North America through the acquisitions of TIC, a mechanical and electrical firm and Ganotec, the largest electro-mechanical company in Québec.

"We recently opened a new office in Perth, Australia; we are now looking at mining from a global, corporate approach. We have 35 business units in North America. Consequently, we need to rationalize this expertise and provide a full, vertical integrated service for the mining industry, from the studies all the way to the mine operation," said Jacques Lacombe, vice president of marketing and business development, Peter Kiewit Infrastructure Co. Kiewit's involvement in mining in the region include

jobs for Vale's new metallurgical facilities at Long Harbour (Newfoundland and Labrador), as well as a long-standing presence at Xstrata Nickel's Raglan site in Québec. "Since 1995, we have been in Raglan where we built the entire infrastructure and did a lot of transition work during construction, as well as pre-stripping and building tailings dams. In Canada, contract mining is not a favorite approach yet, as opposed to other markets like Australia. However, since 1997, we have been active at Raglan's open pit doing contract mining," Lacombe said.

Kiewit is an employee-owned firm and has over ten active partnerships with the First Nations throughout Canada. "One of the first initiatives was the open-pit mining at Raglan, which is executed by a partnership company called Kiewit-Nuvumiut. Work at Vale's Voisey's Bay mine was also done through a partnership with the Inuit and the Innu in Labrador. We are very active in this respect," Lacombe said.

The large iron ore operations in the Labrador Trough and their ongoing expansions are providing new opportunities for contractors.

H.J. O'Connell Construction, another employee-owned company whose roots go back to 1931, has extensive experience

supporting the ferrous operations in this area. The company has a relationship of 40 years with Wabush Mines (today Cliffs) and of 50 years with IOC (Rio Tinto IOC) and Québec Cartier (ArcelorMittal, its largest client on the Québec side), while it is also working at Vale's Long Harbour nickel smelter in Newfoundland and Labrador.

"In our immediate area there are four operating iron ore mines and all of them are expanding. At ArcelorMittal's Fire Lake mine we were originally doing overburden stripping, but now we also drill, blast, load and haul iron ore. Another significant part of our work is tailings confinement which includes a system of dykes and canals that have to be uplifted every year," said Salvatore Furino, President of O'Connell's Québec operations (also known as Les Entreprises de Construction de Québec, LECQ).

These being very large projects, contractors need to invest not only in human capital but also in lots of equipment. "We have one of the largest fleets of equipment in Eastern Canada, most of which is Caterpillar. We have about 150 permanent staff and several hundred labor depending on the projects. We have grown a lot over the last five years," said Terry Curran, vice president of operations in Labrador West, O'Connell.

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Dyno Nobel's Titan emulsion being loaded at Cliffs' Bloom Lake iron mine. (Photo courtesy of Dyno Nobel)

Other diversified contractors in Québec include the Gilbert Group and the Municipal Group; the latter counts subsidiaries including RSM Mining and Grey Rock Mining, with a good presence in the Labrador Trough area. According to Colin MacDonald, operations manager at RSM, it is becoming more common for contractors to provide turnkey services. "We can drill, blast, haul ore and waste and we are responsible for a lot of equipment rentals. We can move concentrate pellets and we are there to fix any water breaks in the system. We are able to provide a full service as we can set up camps, provide rail support and implement rail installation programs."

"The Municipal Group has around 800 pieces of equipment within the Labrador area, and each year we replace around 300 machines. All of our equipment has less than 10,000 hours to increase productivity and efficiency and lower fuel costs, as well as keep pollution to the minimum. This is also a way to attract people to work for us," said Bruno Lajoie, maintenance manager at Grey Rock Mining.

Explosives

Expansions in the Labrador Trough and new open pits like Osisko's Canadian Malartic also mean higher volumes of explosives needed. Some of the world's top players in this field, such as Orica and Dyno Nobel, have been serving Québec for many years. On top of offering a wide range of products, both companies are increasingly focusing on services and solutions.

"We approach relationships with our customers as a partnership to achieve optimum performance. We provide a full suite of services including manufacturing, storage, loading and firing and all of the associated specialist services. We offer tailored

solutions around bulk emulsions, initiation systems and high explosives. We have expertise in underground mining and we have specialized equipment for underground bulk products, which are managed by our division in Val-d'Or," said Lance Tinney, senior vice president, Canada, at Dyno Nobel.

"We are vertically integrated and we have the largest ammonium nitrate manufacturing footprint in North America, which is a key ingredient. We manufacture the whole range of accessories from electric

to non-electric detonators, to new and precise electronic detonators (like the DigiShot Plus) alongside a full range of packaged products. The largest part of our business is bulk explosives for larger operations delivered by trucks. Recently, we have developed some new products in this field that have a lot of benefits for open-pit mines," said Pierre Labelle, general manager sales, Canada, at Dyno Nobel.

The company, owned by Incitec Pivot Ltd. of Australia and whose Americas head office is in Salt Lake City, counts Arcelor-Mittal, Cliffs and Rio Tinto Fer and Titane as customers in Québec. "A lot of our future plans center around iron ore, where we have a very strong competency and capability in Dyno Nobel, particularly in the larger operations in Australia," said Labelle.

"We are geared up for any expansion plans that mining companies have and we are well positioned to grow along with our customers and the industry," said Tinney.

Orica is also focusing increasingly on services. The Australian-listed company has a dedicated division serving the mining industry called Orica Mining Services, with global headquarters in Singapore and 10,000 employees worldwide. "We formulate specific products for specific applications, but more importantly, we want to be seen as the pro-

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vider of an outcome for a mining company. Right now product sales and down-the-hole delivery are the most important businesses for us, but we want to grow in blasting and engineering solutions. In the past we were mainly seen as a product provider,” said Cluny Randell, President for U.S. and Canada at Orica Mining Services.

“Our initiation systems plant in Brownsburg, Québec, is one of the largest ones in the world, and has been there for 125 years. In Val-d’Or we have a major bulk facility serving the Osisko operation. Then, we have a major plant located in the Labrador trough servicing Rio Tinto IOC as well as Cliffs at Wabush. These can be important investments for us; if you have an operation that requires 30,000-40,000 mt/y of product, a new plant can range from C\$5 million to C\$10 million,” Randell said.

Underground work

Due to the underground nature of most mining operations in the Abitibi, there is a need for contractors to assist with the development of galleries, wells, chimneys, shafts, while also taking care of engineering and even contract mining for underground sites. Active providers in these fields in Québec include Dumas Contracting, Montali and Promec Mining.



Daniel Dumas, CEO of Dumas Contracting

Dumas, a firm with headquarters in Toronto and offices in several countries in the Americas, as well as West Africa, now counts 1,800 employees. Clients in Québec since the late 1990s include Aurizon, Agnico-Eagle, Xstrata, Richmond, North American Palladium and Iamgold.

“We create the desire to be retained by our clients. With Aurizon, for instance, we constructed their mineshaft and expanded their underground mine. We also became their contractor during the production phase. We are still there, eight years later. Agnico-Eagle is another example: at Lapa we started with the construction and subsequently were

with them for more than five years. After that, we were selected to do their Goldex mine. Right now, we have a large project with Iamgold, where the shaft will be deeper than 6,000 feet at Westwood,” said Daniel Dumas, CEO of Dumas Contracting.

Dumas affirmed that his firm is very proactive towards clients, offering unsolicited services such as preliminary cost assessments as a strategy to win mining companies’ trust from the beginning of the project. “In the Australian mining model, the contractor is there for the life of the mine. The culture in Canada is much different because companies like to operate their own mines. We like to get in from the early stages of the project, so that we can clearly understand the client’s needs and contribute to the success of the project,” he said.

Dumas Contracting received the Safety Innovation Award by the Ontario Mine Contractors Safety Association (OMCSA) last year and is implementing training programs with the First Nations in several provinces, Québec included. Both the industry and the First Nations should benefit from such collaboration, at a time where the scarcity of miners can be acute.

“At this moment there are not enough people ready to work in the Abitibi, you just have to pay higher salaries than your

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Eric Beaupré, Technosub's director of sales and marketing, at the company's plant in Rouyn-Noranda



Tackling the lack of housing: modular homes at Canadian Royalties' Nunavik site. (Photo courtesy of Plugin Construction Solutions)

competitors. We provide a lot of training, but labor costs are very high in Québec. It takes six to 12 months to train a good miner and our aim is to train leaders that can later manage a team, because training programs are very costly," said Alain Dumont, president of Montali, a Val-d'Or-based underground contractor with operations in Canada and Peru.

Montali started in Canada in 1994 and has 150 people in the country. "For Agnico-Eagle we have probably done 70% of their chimneys over the last ten years, for ventilation or waste passes and ore passes. We are now doing the principal ventilation raise with a length of 600 meters at their Lapa mine. Since 2006, we have done a lot of mining development in veins for Wesdome Gold Mines," said Dumont.

Housing

The remoteness of some of the areas with mining potential and the renaissance of the industry in these regions has prompted a basic, yet essential need: housing for the workers and, in some cases, their families. Stéphane Léduc of Cegertec, an engineering firm with a strong presence in Northern Québec, raised this issue. "We are trying to attract new people by offering salary incentives, but there is a lack of housing. This makes it harder to convince them to move. Our sister company Cegerco built 26 new houses in Mont-Wright, but we need to build new towns in order to attract new people and that will be the real challenge."

While there is a defined life-time for every mine, a company in Montréal called Plugin Construction Solutions decided to look at housing with different eyes. "All construction today is done the same way it was done thousands of years ago: that is, you bring non-industrialized materials to one location. If you look at your watch or your shoes, everything is industrialized

nowadays; this does not apply to construction," said Fred Klein, executive vice president, Plugin Construction Solutions. The company provides turnkey projects in modular housing from design to installation, with a focus on remote locations and harsh climates. The modular homes are manufactured in China, and the company has already won a contract for Canadian Royalties in Québec.

"For Canadian Royalties we have built 114 rooms in three floors which reduces the size of the pad on the permafrost to one third. The savings are enormous. We use a special steel alloy that does not rust

into the body and has a 100-year lifespan at least. The needs of mining companies vary along the years so the investment can be amortized over a period of time and perhaps different relocations," Klein said.

Klein insists the modules are very well sealed to control temperature, humidity and noise levels to provide a better quality of life for workers, with delivery times lower than in traditional construction. "Our speed is a key factor; mines have to wait a long time until they reach production decisions, but once they get the financing, they need to get the mine going really fast. Generally, we take one month for design,



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two months for manufacturing, one month for transportation and one month for installation, for pretty much any size of project," he said.

Dewatering mines

Mines in Canada need to invest significantly in dewatering tools. Technosub, a company established in Rouyn-Noranda in 1983, distributes Tsurumi pumps all across Canada while it also manufactures its own pumps, specifically designed to suit the needs of clients who may have specific problems with slurry and acidic water.

Although international sales still represent a small portion of the business, some of Technosub's pumps have already reached Mexico and Africa.

"Back in the 1980s demand for pumps was huge, but there were delays in the supply of up to two months. Today we are able to provide an immediate response with a quick and efficient solution. To ensure that mines always have a working pump, we can send a replacement pump at no additional cost, so they do not have to stop the operation. This system is quite unique and clients like it a lot," said Eric Beaupré, director of sales and marketing, Technosub.

While distribution of third-party products has traditionally represented the bulk

of the revenue (60% today) Beaupré anticipated significant growth in the sales of Technosub's own products. "The sales in tailor-made solutions are growing every year, especially with the high pressure pump as underground mines are going a lot deeper. We are also expanding our operations into western Canada where there are many open-pit mines, which have different requirements and normally use diesel pumps."

The company employs one hundred people in Canada, and besides Rouyn-Noranda it has branches in Ontario, New Brunswick, Manitoba, Alberta and British Columbia. "Our level of growth is fast and we need to improve our infrastructure as a company to enable us to expand further. The demand is extremely high, and this spring has been particularly busy in Canada, as it has rained more than average, and mines have had a lot of problems with flooding," Beaupré said.

Québec, a manufacturing base

Technosub's case is just one example of how Québec's mining expertise has translated into the development of a value chain through manufacturing. In drilling for instance, Québec manufacturers not only serve nearby contractors, but also they are significant exporters.



Alain Paquet, vice president, Fordia

Fordia, a manufacturer of diamond tools and equipment for mineral exploration, exports 60% of its production and is present around the globe. The company gained an advantage in the marketplace by forging in-house developed alloys at its furnace, and targeted international expansion since the 1980s. "It was very difficult to move into other countries and at the beginning we followed the drilling contractors that went overseas to interpret the information they gave us. We hired experienced drillers who were able to assess and make relevant adjustments depending on the ground conditions," said Alain Paquet, vice president, Fordia.



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Alain Béland, President, Machines Roger International

Innovation was key for success, Paquet emphasized. "In diamond tools we have developed a solution to increase the height of the crown, without making it fragile. Fordia has also developed a device that allows geologists to trace the direction of the core, which is important for vein-type deposits."

Innovation in Québec is not uncommon in the drilling business. Machines Roger International, for instance, is increasingly exporting its V30 boring head invented by its founder. Based in Val-d'Or, the company has diversified over the years into drilling services, both in diamond drilling and underground drilling (for production holes, service holes and primary openings) to complement its manufacturing business which counts clients in the Americas, Europe, Africa and Australia. As a contractor the business is concentrated in Canada.

"Manufacturing and contracting are a good fit. When we are hired to do underground work with the V30, we provide training and at the same time we demonstrate how our machines work. So far the business model has worked well, and we have even sold machines to competing contractors. If competitors buy our product, it is because it is proven and it serves them well," said Alain Béland, President, Machines Roger International.

"The V30 adapts to a regular in-the-hole (ITH) drill. The combination of both costs as much as purchasing a small raise boring machine with the advantage that the V30 allows you to do all your slots, but also all the production drilling as well. Big OEMs sell raise-boring machines that are typically used in very deep holes, like 200 or 300 m. The V30 is used in an application where you are typically looking at a 25-45 m holes. Our machine opens the primary slot that is required for blasting the stope underground," said Roger Perron, manager business development at Machines Roger.

Machines Roger has a strategic alliance with Winnipeg-based Cubex, who manufactures ITH drills specifically adapted to work with the V30. "The V30 head is really a unique production tool used worldwide in medium and large volume mechanized mines. It assures a better productivity than conventional methods," Béland said.

Another manufacturer in Val-d'Or is VersaDrill, a company created in 2000 with the aim of producing versatile rigs that could be used in both surface and underground drilling for exploration purposes. To this novelty, the company added the use of aluminum as the main material in a market dominated by steel equipment.

"We used 80% aluminum in our rigs because aluminum is strong, light and does not rust. The rigs we manufacture for surface only, however, are 85% steel and 15% aluminum. Initially the market did not receive very well our aluminum products because aluminum is perceived to be weaker than steel. We believe in the product and I think aluminum will be the future", said Serge Bellefeuille, President, VersaDrill.

VersaDrill has a contract with Fordia to supply rigs to them, which are sold in Canada and internationally under the Fordia brand. In 2010, the company sold 19 rigs, 15 through Fordia.

According to Bellefeuille, VersaDrill is in the process of re-designing all rigs to increase their strength and the efficiency of their hydraulic systems without increasing its weight, and announced expansion plans with regard to the production capacity. "Currently we have a capacity of three rigs per month and we are planning to build a new facility in Val-d'Or to increase our productivity to 80 rigs per year. The waiting period for a drill rig now is four or five months, although we want to get it down to a maximum of three months. For that we will need to hire at least 10 more people and we will use other local contractors to help us manufacture parts for the rigs," he said.

Bigger equipment

Hewitt Equipment is the official Caterpillar dealer in Québec, the Maritimes and Western Labrador for both the open-pit and the underground segments. The company, established in 1952, has 2,200 employees today and 44 places of business. While most of the open-pit business is in the Labrador Trough (Hewitt has recently opened a 65,000 square foot branch in Wabush), Osisko's Canadian Malartic gold mine in the Abitibi was a significant milestone for the company. "In 2008, we signed the largest transaction in Hewitt Equipment's his-

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tory for Canadian Malartic, for a total value of C\$85 million. Hewitt worked very closely with Cat Finance who provided a financing solution. Over the last five years, there has been a trend of miners looking for a more holistic solution in terms of an equipment package, a total maintenance contract, as well as a financing solution. We are close to being a one-stop shop," said Jim Hewitt, son of the original founder and President and CEO.

The high demand for large pieces of equipment has an impact in delivery times and the need for spare parts and maintenance technicians. "In 2008, the lead times for heavy equipment in particular were becoming very challenging, but they eased off during the recession. Today, despite Caterpillar ramping up their production capabilities very significantly since 2008, lead times are starting to stretch out again, even though they remain manageable," Hewitt said.

With regard to the availability of people, Hewitt has been implementing significant training programs in-house. "More than half of our employees are dedicated to product support. For the last eight years, we have had about 40 young graduates per year training as technicians. In the heavy equipment training side, apprentices have a 15-month in-class training program. It is a very significant investment on our part. Today, with the significant growth prospects, we are looking for over 130 technicians on top of the 80 apprentices from the 2010 and 2011 programs."

Other suppliers of equipment with manufacturing plants on Québec soil are Dux Machinery, Mecfor and Val-d'Or based CMAC-Thyssen (who also provide contract mining services).

Dux Machinery Corp., founded in 1969 and based in Repentigny (near Montréal), is a manufacturer of trucks for underground operations. Its business lines include haulage trucks, utility equipment and scaling equipment with a strong focus on exports.



Jim Hewitt, President and CEO, Hewitt Equipment

"We are very strong in engineering because we can custom manufacture the truck that the client needs, which is something a major manufacturer will not do. We can come up with a tailored solution. Our production capacity varies as we can always subcontract work if needed. We can produce up to 50 trucks per year," said Caroline Bumuelle, marketing manager, Dux Machinery.

"We have haulage trucks, from seven to 50 mt. Within that line we have three types: the standard dump truck, the teledump truck and the ejector truck. We are particularly proud of the two-section design of the teledump truck because it is fairly unique. Then, our S1 porter is one of our most exciting products because with one porter you can have interchangeable modules for different tasks. You can have a maintenance cassette, a lube cassette, a personnel cassette and so on so forth, so it becomes a multi-purpose truck," said Bumuelle.

With significant presence in international markets like Chile, Dux Machinery would like to increase sales in Québec (where it counts Iamgold as a customer) and Canada in general.

"Our equipment is generally heavier than our competitors', which makes it

more expensive initially, but it is also more durable. We are not a major company so we cannot afford to have quality problems or low durability. In some products we get to compete with the big manufacturers, but our best chances are in the niches where we can fill in a particular need," Bumuelle said.

Another medium-sized company that has the flexibility to design tailor-made equipment is Mecfor. Part of the same group as Cegertec (engineering) and Cegerco (construction), Mecfor is increasingly moving from its traditional niche in the aluminum business to provide more equipment to the mining sector.

"With the crisis, the price of aluminium dropped from US\$3,600 to US\$1,800/mt and our sales went down by half in 2009. This acted as a wake-up call for us to diversify. Our objective is to replicate our success in the aluminium industry with the major mining companies," said Éloïse Harvey, President of Mecfor.

Inorganic growth is supporting this diversification. Mecfor has just acquired Maxter, a company producing elevating tailgates and body trucks among other products.

"We have a strong engineering team that has met the demands of the aluminium industry for years. We have a mobile equipment line but also we are leaders in anode grooving equipment worldwide. Some of the products were actually developed as per the request of a client," said Danny Savard, vice president of business development, Mecfor. A recent development in this respect has been a machine for rail maintenance, designed for ArcelorMittal.

"Competing with China and India in costs is not possible; competing with the big product lines of Caterpillar is not possible. Yet, we can find value-added niche product lines. Québec is definitely a great place for innovation: it is much more than Cirque du Soleil and Bombardier," Harvey said.



Dux Machinery manufactures trucks for underground operations at its plant in Repentigny, near Montréal.

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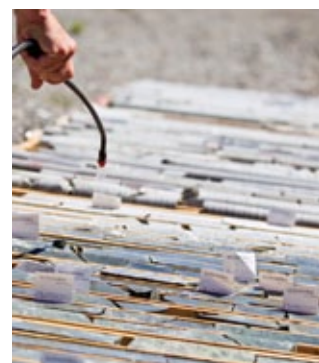


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