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Exploration in Emerging Environments

A Monday Morning Musing from Mickey the Mercenary Geologist

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May 18, 2009

It's a well known fact that geologists like to go to the bar after work and drink beer. At the bar all we talk about is what we do all day long, i.e., work. It's no secret that secrets become less secretive after a few brews, news and rumor from the bush are exchanged freely, stock tips get traded, maps, sections, and cartoons are scribbled onto bar napkins, and other patrons are disturbed by loud alcohol-fueled arguments as the session wears on.

But these nightly confabulations are an integral part of our business. More exploration and mining deals are put together in dark and dingy pubs after work than in the corporate boardroom or on the golf course combined.

A recent topic of conversation at the bar has been the dearth of success in finding giant ore deposits during this six year exploration bull market. The junior resource sector is a boom and bust business driven largely by the commodities cycle and especially the price of gold. The current bull cycle started in mid-2003 when an ounce of gold went over \$300 and stuck.

Some may argue that we are no longer in a bull market but I will point out that about \$5 billion has been raised via the Toronto markets for exploration, development, and mining projects since the beginning of the year. Most of that money will go into the ground during the next two years, delineating and developing new deposits, and keeping many geologists and engineers gainfully employed.

However, I can think of only two giant grassroots discoveries in the present cycle: the Fruta del Norte gold-silver deposit in southeast Ecuador and the Navidad lead-silver deposit in Patagonia Argentina. Both discoveries occurred in underexplored regions with known mineral potential. The first was sold to a major during a government-mandated mining moratorium and remains in an inferred resource category. The second was awarded in litigation to another junior because of breach of confidentiality. Navidad is undergoing delineation drilling but currently is burdened by a Chubut province ban on open-pit mining. There are other discoveries that may eventually prove to be major deposits. The Long Canyon gold discovery in eastern Nevada comes to mind but will require much additional drilling to determine its size potential.

Our rate of new discovery in this boom has been abysmal. For the tens of billions of venture capital dollars poured into exploration projects, a commensurate measure of wealth has not been created.

Why is that? I'll provide some historical background on Canadian junior exploration before addressing the question.

The junior resource sector traditionally has focused on *greenfields* exploration. "Greenfields" may be defined as grass roots, reconnaissance-style exploration in frontier geological terranes. In past booms, many juniors explored in the hinterlands, a very few made big discoveries and sold out to mining companies, and the great majority failed and became shells until the "next big thing" in the venture capital markets came along. The single exit strategy was to sell to a major miner. Most simply mined the stock market ([Mercenary Musing, October 20, 2008](#)) since few found a deposit worthy of mining in the ground.

Greenfields exploration programs were largely confined to North America, specifically Canada and the United States. No junior went south of the border to explore because no foreign entity could control a Mexican corporation. Expropriation and nationalization of mining operations in the 1970's in countries such as Chile and Peru discouraged majors and juniors from exploring in those endowed places. Leftist governments, civil wars, guerillas, and terrorists made Central America and parts of South America off-limits in the 1980's. Other continents were not on any junior's radar screen. There was still plenty of *blue sky* in Canada and the western US. The Aussie juniors stayed put on their big island, too.

This provincial outlook changed during the exploration boom of 1991-1997 and was driven almost exclusively by geopolitics. Mexico's mining law changed in 1992 allowing foreign ownership. Democracy came to western South America and terrorist organizations were debilitated. The Soviet Union disintegrated and Russia and the mineral-rich "Stans" became exploration destinations. Civil wars and internal unrest abated in parts of Central America. Juniors explored in far-flung places thru out the world including former communist and fascist countries of Southeast Asia and new nations in southern and western Africa.

Several major greenfields discoveries were made by junior resource companies. Examples included world class diamond mines in the Northwest Territories, a giant nickel-copper-PGE mine in Labrador, and a large gold mine in Peru. Significant discoveries were made by juniors in eastern Russia, Indonesia, western Africa, Mexico, and South America.

Unfortunately this boom was killed by numerous gold salting scams including Bre-X in Kalimantan, Delgratia in southern Nevada, and Timbuktu Gold in western Africa and a low price commodity cycle. Contributing factors to the abrupt end of the bull market in 1998 included mineral tenure problems in various countries, a coup in Indonesia, organized crime issues in Russia and some CIS countries, civil wars and economic instability in others, and worldwide economic downturn as globalization failed in Southeast Asia.

Western geologists had made numerous discoveries in many countries that were explored for the first time in the 1990's. When the cycle of low commodity prices ensued, most of the newly discovered deposits remained undeveloped and smaller mines that had been put in production soon failed.

However, during that time that ended so badly for our business, the entire world was the proverbial oyster of the exploration geologist. We became experienced world travelers and learned a second or third language with the aid of "sleeping dictionaries"; some married the same, and many expatriated to second and third world countries. Important logistical support, infrastructure, and both public and private contacts for mineral exploration and development had been established around the globe.

This exploration boom is fundamentally different than all that came before and contributing reasons for fewer major greenfields discoveries are many:

- Stock market regulations resulting from the scams of the late '90's have led to quality control of data and strict requirements for public posting of material news.
- 43-101 regulations for classification of resources and reserves resulted in investor, newsletter, and analyst demand for junior companies to fast track their flagship projects to resource definition and economic studies as rapidly as possible.
- The internet has produced a transparency of corporate reporting and information, company and insider transactions, and exploration program results with a concomitant increase in corporate responsibility and investor savvy.
- Most regions of the world with giant mineral endowments have entered a mature phase of exploration under post-mineral cover or at increasing depth. Exploration, development, and mining are more difficult and expensive with lowered chances of success in these areas.
- Much of the Earth now has been trod many times by geologists and most outcropping deposits have been discovered.
- Because the boom ended so abruptly in 1997-98, many significant mineral occurrences that had been discovered over that six year period were not drilled and killed. They were only partially defined, delineated, developed, or mined and remained viable projects.
- Geologists and engineers who had worked for major mining companies were laid off in the late 1990's. In the 2000's, they moved to the junior resource sector with knowledge and experience in the lesser explored parts of the Earth. Their contacts with former employers led to acquisition of many advanced projects deemed too small or marginally economic by the majors.
- Technological advances in bulk mining methods and metallurgical processing combined with high commodities prices have turned previous mineral resources into ore reserves.

Because of these many factors, most juniors have focused their equity dollars on *brownfields* exploration instead of the greenfields exploration role that juniors traditionally have filled.

“Brownfields” may be defined as exploration around current or previously operating mines and districts or expansion, advancement, and development of known deposits that were marginally economic or subeconomic, partially explored, delineated, developed, or mined in the past.

For a few juniors, focusing on a flagship project and advancing it from exploration, delineation, and development to eventual mine production has paid off handsomely for shareholders. Many other junior explorers are now making the transition to small or mid-tier mining companies with the goal to generate cash flow. Juniors did not mine in previous booms. Mining is risky. Some will succeed, some will fail.

The overall success ratio of junior companies has not been good. It never is and that's just the nature of our business. The majority of companies funded during the irrationally exuberant boom days of 2004-2007 did not own projects with the geological merit to make ore bodies. Management, because of inexperience, incompetence, or indifference, did not tightly control share structure, finance timely,

explore wisely, or spend equity dollars frugally, and when the economy went south so had their working capital. Now they are broke, trading for pennies, and on the road to *shell hell*.

Many have failed, more are failing, and many more will follow as time goes on. This purge is welcomed by most seasoned professionals as there were too many companies with little chance of success. The junior resource industry will emerge in the next year with many fewer but much stronger companies.

Giant ore deposits are found by field geologists in *greenfields* exploration programs. The recent emphasis in the junior resource sector on advancing flagship projects to development and production decisions has resulted in few and fewer dollars budgeted for generative greenfields exploration programs.

Fewer dollars means fewer geologists walking fewer kilometers, taking fewer samples, and drilling fewer holes resulting in fewer major ore discoveries. This is partly by necessity: There just aren't that many prospective places left on Earth where some geologist has not traversed.

Simply put: Geologists are running out of virgin geological terrane that is prospective for discovery of giant outcropping ore bodies.

That said, there are still places on the planet that are under explored and under developed. These areas may be called *emerging environments* and include countries that largely were left untouched during the boom of 1991-1997, most often because of unfavorable geopolitical conditions.

A prospective emerging environment should have the following characteristics:

- First and foremost, requisite geological setting favorable for formation of major ore deposits. It should be on a tectonic plate boundary, structural fold belt, or suture zone that has known economic mineral occurrences in country or major ore deposits in adjacent countries with the same geological setting.
- Stable, democratically elected, transparent government with manageable bureaucratic and corruption issues, populist respect for the rule of law, and an independent judiciary.
- Free market economic system with entrepreneurialism and venture capitalism encouraged and foreign investment welcomed.
- Favorable taxation, importation, and expatriation regimes and membership in regional geopolitical, world trade, and international arbitration organizations.
- Secure mining law and mineral tenure system and surface rights that can be acquired with reasonable cost and effort.
- The international community, particularly the United States and Europe, with a specific or strategic interest in the environment in which investment is to be made. Financial participation by international banking organizations or major mining companies lends credence to a country's acceptable geopolitical risk/reward profile.
- No significant terrorism, random violence, or organized crime issues.

- Reasonable access, infrastructure, and exploration costs, especially for drilling.
- Lack of significant local opposition to exploration and mining or threat of major NGO-financed opposition efforts.

Once a country is chosen, a company maximizes its chances of success by:

- Developing an exploration and/or acquisition strategy from study of the prospective geological environments and with thorough understanding of the nature and quality of previous work by government and private firms.
- Acquiring a trustworthy local partner with influence, honesty, and an in-depth knowledge of country and local issues including economics, politics, business protocol, community relations, social attitudes, and environmental problems, constraints, or legacies. A local labor supply with a strong work ethic is required.

Exploring in emerging environments is attractive for two reasons:

- Major outcropping ore deposits are more likely to be found by simple “boot leather and drilling.”

Recent technological advances in remote sensing techniques such as satellite imagery and alteration mapping, regional geochemical exploration, and regional geophysical data processing have improved prospecting efficiency with better and more focused target selection prior to field examination.

- Advanced projects, deposits, or past-producing mines can be acquired and developed in fast-track fashion.

The first company to invest in an emerging country often can acquire the best and most advanced projects, deposits, and mines that were scuttled in the past because of geopolitical events, bureaucracy, mismanagement, and corruption, demise of a centrally planned economy, and/or lack of understanding of capitalistic principles.

Emerging environments with recent exploration success stories include Armenia, Haiti, Colombia, Indonesia, and Burkina Faso. I will review specific companies in some of these countries in subsequent Mercenary Musings.

Exploration in other emerging countries has been technically successful but development of economic mines has been derailed.

For instance, a junior resource company defined the world class copper-gold porphyry at Oyu Tolgoi, Mongolia in the early 2000's. A subsequent windfall profits tax adopted by the government has left successful mine development and project economics in serious doubt not only for this project but all exploration and mine development in country. Mongolia is now regarded as an environment with unacceptable geopolitical risk.

Permitting and development have been delayed on the previously mentioned world class discoveries in Ecuador and Argentina.

These cases illustrate the difficulties and potential pitfalls of working in emerging environments. Geopolitical risk factors can and will change rapidly and unpredictably.

However, venture capital will always flow where perceived risk is lowest and possible reward is highest.

Exploration in emerging environments balances high risk with high reward. Risk can be mitigated by an in-depth knowledge of a country's geopolitical situation, international standing, government structure, socio-economic environment, and a commitment to best practices exploration and sustainable development with a local participating partner.

Much like the individual considering a company for investment, a junior resource company considering greenfields exploration in emerging environments must do thorough due diligence. It must choose countries where deposits can be found, mines can be developed, and profits can be returned to shareholders.

The potential reward of being the first field geologist exploring in virgin geological terrane is discovery of a world class ore body.

And that's enough to excite any Mercenary Geologist.

If you are interested in listening to an interview with Al Korelin and me on this topic, I invite you to visit the following link: [Exploration in Emerging Environments](#).

Ciao for now,

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The [Mercenary Geologist Michael S. "Mickey" Fulp](#) is a Certified Professional Geologist with a B.Sc. Earth Sciences with honor from the University of Tulsa, and M.Sc. Geology from the University of New Mexico. Mickey has 30 years experience as an exploration geologist searching for economic deposits of base and precious metals, industrial minerals, uranium, coal, oil and gas, and water in North and South America, Europe, and Asia.

Mickey has worked for junior explorers, major mining companies, private companies, and investors as a consulting economic geologist for the past 22 years, specializing in geological mapping, property evaluation, and business development. In addition to Mickey's professional credentials and experience, he is high-altitude proficient, and is bilingual in English and Spanish. From 2003 to 2006, he made four outcrop ore discoveries in Peru, Nevada, Chile, and British Columbia.

Mickey is well-known throughout the mining and exploration community due to his ongoing work as an analyst, newsletter writer, and speaker.

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