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The Outlook For Copper Futures



Excelsior Mining Corporation's Gunnison Property is located 65 miles southeast of Tucson, Arizona within the copper porphyry belt.



peter GRANDICH

*North of
the Border*

There are two schools of thought when it comes to copper's outlook:

- Copper prices shall remain quite strong for the foreseeable future thanks in large part to China's strong appetite.
- Copper prices should weaken considerably in the foreseeable future thanks to slowing demand from China.

Guess what the main key is to the future price of Copper? A brass ring to those who said "demand from China".

And in case you thought this article will reveal the correct answer, sorry, I wouldn't bet the ranch one way or another. However, if one is looking for a couple of copper stocks that could prosper in either case or somewhere in the middle, please read on.

I've been speculating on bidding on a copper play in Arizona that features two clients of mine. Both are planning on using a technology that has been around for a while but has not been used a lot when it comes to copper mining. The

belief that they can both be successful with this technology and thereby offer large-scale profit margins is the key to this play. The technology is In-Situ Recovery (ISR).

ISR is an environmentally-friendly process by which copper can be extracted from the ground with minimal disturbance to the surface environment.

What is In-Situ Recovery (ISR)?

ISR is an environmentally-friendly process by which copper can be extracted from the ground with minimal disturbance to the surface environment. ISR mining has a long history, start-

ing with uranium mining in the 1960s. Arizona now has 9 of the 14 historical and current global copper ISR projects and has a positive track record for ISR permitting. The San Manuel copper mine, owned by BHP Billiton, was a successful operation that integrated ISR methods with open pit and underground mining and produced approximately 3.25 billion pounds of copper in 14 years of production. Two additional projects owned by BHP Billiton, Pinot Valley and the Miami Unit, also used ISR to extract copper (combined with SX-EW in the case of the Miami Unit). The Florence Copper Project, owned by Curis Resources Ltd., is located roughly 150km to the northwest of Gunnison and is host to a resource of 2.84 billion pounds of oxide copper. The project, which took only 18 months to fully permit, is set to commence production in 2012.

Advantages to In-Situ Recovery Mining:

- Lower capital and operating costs;
- No waste or ore moved;
- No creation of open holes, waste dumps, leach pads or tailings;

- Minimal visual disturbance;
- Minimal noise, dust and greenhouse gas impact;
- Fewer permits are required compared to other mining processes;
- More cost-effective than most other conventional mining techniques, and thus doesn't require as many "pounds in the ground" to make the mine economically viable.

These advantages allow access to copper deposits not amenable to conventional mining.

How soon can an ISR mine go into production?

An ISR mine can take as little as 18 months to permit and a year to build, while it can take at least 3 to 7 years for a conventional mine to be permitted and built. This is because there is less disturbance of ground material and considerably less destruction to the surface and sub-surface material.

How does ISR work?

ISR is a non-invasive mining method whereby boreholes or "injection wells"

are drilled into an ore-body, through which a dilute solution is pumped to dissolve the target minerals or metals. The solution moves through the rock in a controlled manner to nearby recovery wells, where it is pumped back to the surface for processing.

Differential pumping rates or natural impermeable barriers are used to control the movement of the solution through the rock. This, combined with well field design, prevent any solution from exiting the mine area. For example, an injection well is usually surrounded by a ring of recovery wells. The pumping action of the recovery wells make sure all of the pregnant solution is collected from the injection well.

For example, in ISR mining of copper oxide ores, the dissolving solution is usually weak sulfuric, the same acid used in open pit and dump or heap leach operations around the world. In effect, the bore holes or wells become the "mine access" and the leach pad is "left underground." Processing is usually done by chemical precipitation or solvent extraction electrowinning (SX-EW)

"Copper Futures" continued on page 8

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“Copper Futures” continued from page 7 Is ISR safe?

The wells used for injection and recovery are all closely monitored and arranged to ensure the containment and control of the mining solution. Closure on a copper ISR operation usually involves cessation of solution injection with continued, moderate, recovery well pumping that flushes any remaining solution from the rocks. Wells can then be filled with cement so that the land can be returned to its original state.

The United States has very strict guidelines for ensuring the safety and health of its citizens. The Department of Environmental Quality ensures that during ISR mining no solution escapes from the mining area. Following ISR mining, a company must return groundwater to background chemical levels (levels prior to when mining began), even though the groundwater is not used for any other purposes.

What are the limitations of ISR?

The optimal conditions under which to use ISR for copper mining follow a few guidelines. Firstly, the host rock needs to be fractured enough to allow for the solution to permeate through and dissolve the

copper resource. The more fractured the rock, the more surface area there will be for the copper to be dissolved.

ations, LLC, and is editor of The Grandich Letter which was first published in 1984. On his internationally

The United States has very strict guidelines for ensuring the safety and health of its citizens. The Department of Environmental Quality ensures that during ISR mining no solution escapes from the mining area.

Secondly, the copper resource must be below the water table. Without the mentioned guidelines, the in-situ process will be ineffective or will not comply with standards set out for mining procedures.

The two companies are:

- Curis Resources (CUV-TSX)
- Excelsior Mining (MIN-TSX-V)

Run, don't walk to your computer and do due diligence on both ASAP!

followed blog he comments daily about the world's economies and financial markets and posts his views on social and political topics. The result is an insightful and intuitive look at business, finances and the world, set in a vernacular that just about anyone can understand.

He is a member of the National Association of Christian Financial Consultants, and a long-standing member of The New York Society of Security Analysts and The Society of Quantitative Analysts.

Peter Grandich is the founder of Grandich.com and Grandich Publi-

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