

Tuesday, April 27, 2010



Hallgarten & Company

Metals Review

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Rare Earths

The GAO Report –
Mapping the Road Not Taken

Rare Earths

Mapping the Road Not Taken

- + The Rare Earth industry languished in obscurity for decades as the Chinese gradually assumed dominance of supply in the space.
- + Alarm bells are ringing in official circles on the Chinese dominance of this strategic sector resulting in the GAO issuing a report in April that highlights the need for more domestic (or at least Western World) production of REEs.
- + The upcoming Molycorp IPO will shift REE out of the “for cognoscenti only” category into what might pass for “mass market awareness” in the institutional world.
- + The spin-offs from the IPO will be felt by a feeding frenzy in the second tier of REE wannabes with easier financing possibilities for those with serious intentions of becoming producers.
- ✘ The GAO report made clear that the defense contracting sector has been woefully neglectful of its raw material supply chain with potentially serious strategy implications for the US.
- ✘ The Chinese are still the largest suppliers by far and may push faster to achieve the technology transfer they desire by cutting off all exports in the very short term if they perceive that eventual Western reactivation may foil this strategy.
- ✘ There is a substantial financing need in the sector with mine and processing plant buildouts costing north of \$100MM and frequently much more. Current high valuations and market caps for the “sexiest” in the sector may make managements wary of raising serious cash while the mood is good in the sector.
- ✘ Molycorp will not bring enough production to plug the supply gap in the US let alone the rest of the Western World.
- ✘ Rare Earth players include a number who do not seem serious about mine-building and may be just paying lip-service to the concept. Very few have made moves that might hasten production any time in the foreseeable future.

The Phony War

After a brief lull in the gunfire in the battle over Rare Earths the heavy artillery is now being drawn into position and a big shell has just gone whizzing over the marketplace in the form of the GAO’s long awaited report on US dependency on Rare Earths. The real barrage is yet to come with the Molycorp IPO set to ride the resurgent chatter in the sector and the politicians will begin to wade in and see how Rare Earth can be turned into pork with some Washington alchemy.

The GAO Report

Obviously with Congress as its audience and with a lot of Rare Earth “virgins” within its constituent target audience the GAO dumbed down the REE issue for the recipients. It was however a good primer for neophytes. The vast bulk of the report was no surprise as we all know the ball has been dropped in this space and not only by the US but by a whole swathe of Western economies. It is readable here: <http://www.gao.gov/new.items/d10617r.pdf>. The staff of the GAO sent the briefing to the committees

on April 1, 2010, and subsequently briefed the Senate Armed Services Committee staff on April 5, 2010, and the House Armed Services Committee staff on April 6, 2010. It also sent copies of the report to the appropriate congressional committees as well as the Secretaries of Defense, Commerce, Energy, and the Interior. No one can now claim they haven't seen it.

The essential theme of the report is the rise to dominance of China. The eclipse of the US (and others) began from the mid-1980s when China effectively undercut the prices of most other producers and sent production spiraling down around the world to the current state of affairs. The important Steenkampskraal mine in South Africa was shut down decades ago and the Mountain Pass operation was mothballed in 2002. Ex-CIS mines mainly in Kyrgystan, Estonia and the Kola Peninsula in Russia shut after the breakdown of the old Soviet empire. The ongoing non-Chinese output was from sands in India and some desultory production from the Brazilian national nuclear authority. At times in the more distant past, Sweden and Finland had been small producers. Most reports put the Chinese market share in REE at 93% at the current time but we have seen some reports of 97%. Demand is on the rise (as evidenced in the projections below) with even China (if it was any longer willing) being unlikely to make up the supply gap.



Beyond the REE 101 elements of the report we thought it might be useful to list the takeaways that were not already circulating amongst those interested in the evolution of all matters related to REE.

- Some REE are used in Department of Defense (DOD) precision-guided munitions. Some of these applications rely on permanent rare earth magnets that have unique properties, such as the ability to withstand demagnetization at very high temperatures.
- Based on industry estimates, rebuilding a U.S. rare earth supply chain may take up to 15 years and is dependent on several factors, including securing capital investments in processing

infrastructure, developing new technologies, and acquiring patents, which are currently held by international companies.

- Government and industry officials have identified a wide variety of defense systems and components that are dependent on rare earth materials for functionality and are provided by lower-tier subcontractors in the supply chain. Defense systems will likely continue to depend on rare earth materials, based on their life cycles and lack of effective substitutes. The GAO found examples of components in defense systems that use Chinese sources for rare earth materials and are provided by lower tier subcontractors.
- Some DOD components, other federal agencies, and companies are taking initial steps to limit their reliance on rare earth materials or expand the existing supplier base. But it admits that the development of alternatives to rare earth materials could reduce the demand and dependence on rare earth materials in 10 to 15 years, but these materials might not meet current application requirements.
- The United States is not currently producing neodymium iron boron (NeFeB) permanent magnets and has only one samarium cobalt (SmCo) magnet producer.
- The future availability of materials from some rare earth elements, including neodymium, dysprosium, and terbium, is largely controlled by Chinese suppliers.
- Industry officials noted that processing companies will need to secure a large amount of capital to begin operations, but investors are concerned about the possibility of the Chinese undercutting U.S. prices and negatively affecting their return on investments.
- Industry officials said it would take from 2 to 5 years to develop a pilot plant that could refine oxides to metal using new technologies, and companies with existing infrastructure said they would not restart metal production without a consistent source of oxides outside of China.
- Some rare earth minerals are accompanied by radioactive products, such as thorium and radium, which make extraction difficult and costly. In addition, U.S. mines and processing facilities must comply with environmental regulations.
- Departments and agencies identified a range of systems and components whose production could potentially be delayed due to a lack of availability of rare earth materials. DOD officials stated that this information was not based on a formal study on the use of rare earth materials in these systems.
- The use of rare earth materials is widespread in defense systems. These include, among others, precision-guided munitions, lasers, communication systems, radar systems, avionics, night vision equipment, and satellites. Meanwhile officials emphasized the significance of the widespread use of commercial-off-the-shelf products in defense systems that include rare earth materials, such as computer hard drives.
- The M1A2 Abrams tank has a reference and navigation system that uses samarium cobalt (SmCo) permanent magnets. The samarium metal used in these magnets comes from China.
- The DDG-51 Hybrid Electric Drive Ship Program uses permanent-magnet motors using neodymium magnets from China.
- A 2009 National Defense Stockpile configuration report identified lanthanum, cerium, europium, and gadolinium as having already caused some kind of weapon system production delay and recommended further study to determine the severity of the delays.
- Rather embarrassingly, while not related to rare earth materials, Industrial Policy worked with the Army to request a waiver that would allow the Hellfire Missile program to procure a chemical from China that was no longer produced in the United States.

- In 2006, the Navy considered funding the Mountain Pass mine and processing facility under a Title III program to secure a domestic source of supply for rare earth materials but ultimately did not award a contract for that purpose as it lost interest in the project.
- The DOD has initiated a Title III program for domestic production of traveling-wave tubes for the Navy, however the program does not address domestic sources for the rare earth materials that are required for their production.
- A major defense contractor is informally surveying its suppliers to understand rare earth materials use in its defense system components and determine alternative solutions to their use.
- And finally, the understatement of the report “Rare earth industry and defense contractors have raised concerns about the Chinese monopoly for rare earth metals”.

Truly this is a litany of opportunities missed and duty shirked. Some of these excuses would be dismissed as true obstacles in a wartime scenario as cutting through the hype would be a priority. However many in business would sustain that a wartime scenario already exists in the commercial world as far as relations with China are concerned.

In peacetime these molehills become mountains. For instance, we believe the comment that a pilot plant would take two to five years to set up is utter rubbish. One could be built in six months if wanted. They are hiding behind the desire to create a state of the art facility. The state of the art is Chinese these days and a lot of their REE processing is rustic indeed. If you can't beat them, join them. Avalon's budget for Thor Lake is hundreds of millions of dollars while Great Western's for Steenkampskraal (using Chinese know-how) is \$30MM. Who is right?

The defense contractor that finally stirred to “understand” REE usage by its suppliers is somewhat laughable. In the good old days of the command economy in the Soviet Union, such management would be sent off to the salt mines to consider their omissions at leisure.

As for REE commonly appearing with thorium, a lightly radioactive substance, then the US needs to deal with the issue of NIMBYism that has paralyzed so many mining operations in the US and come up with safe mining conditions that take this into account.

The response of some contractors (and seemingly the Department of Energy) to “move away” from using REE as an input is avoiding the issue and shows they are prepared to sacrifice the usefulness of REE as a cutting edge technology component to avoid grappling with the supply issue (i.e. investing in the supply chain). The Ostrich approach.

One has to love the line about contractors being concerned about Chinese undercutting prices for it was this thinking that created the crisis in the first place.

The waiver for the Hellfire missile could, unfortunately, be anyone of a number of specialty metals that the US has abdicated a mining presence in and where the Chinese have seized the marketplace. A key thing to note is that temporary dominance may be merely transient as China has NO metal in which it is the exclusive holder just a dominance (antimony, REE, tungsten etc) at this point in time. Ground can be recaptured but only with a will.

Wall Street's role

The topic of vertical disintegration (in both senses of the word) is one that we shall expand upon more in a future note covering a wide range of metals, particularly specialty metals. Essentially many corporates in the Western World used to ensure their access to scarce inputs by owning the means of production i.e. securing their upstream supplies. Investment fashion in recent decades required that managements parsed their various activities down to the “nth” degree and identified how much of revenues and profits derived from all aspects of a manufacturing business. Where a mining operation was part of the supply chain it was very easy from the 1970s to make a case that the mine was unprofitable and a drag (in virtually every category of metals) and thus something better spun off, sold or closed down. RIP much of the US specials metals mining capability. Wall Street loathed conglomerates and the idea that a defense manufacturer or even an auto or electronics firm should have a division that did not “make a profit” but helped the rest of the firm do so didn't fit with the management theories that required that every stone be squeezed dry of blood to contribute to the bottom-line and the Gods of EBITDA and P/E.

Companies thus would be punished for “extraneous” activities. Mining of these metals, particularly once China started exporting these products at rock bottom prices after the mid-1970s, looked to be an indulgence if a Western manufacturer persisted in the practice. Interestingly the Japanese never suffered from such “market disciples” forcing it to divest mining because its companies were notoriously impervious to short-termism and market fetishism. However, because of lingering memories of the Greater East Asian Co-prosperity Sphere, particularly in Australia, it was the Japanese trading houses (C.Itoh, Marubeni, Mitsui, Mitsubishi, Sumitomo etc) who took strategic stakes in mines (and larger shares of the offtake) to ensure that the mothership in the Zaibatsu had sufficient raw materials to distribute to the hungry maw's of group companies in Japan's Great Leap Forward from 1949 until 1985.

Meanwhile the corporate West furiously disintegrated (again in both senses) while governments were urged by budgetary zealots to offload strategic stockpiles. After all, selling down the strategic stockpiles, particularly in the US, meant that industry got the government to depress prices of metals and sell industry “cheap” raw inputs, often at a loss when one considered the accounting for the original purchase price of the product in the 1950s and 1960s, the financing cost, the storage cost and the opportunity cost for all those decades.

S.O.S.

It is curious that in the Age of Tea Parties that the rallying cry should be to spend government to stash away strategic materials so that Boeing, Honeywell, GE, Northrop Grumman et al should have an on-hand supply of REE or whatever else they deem “strategic”. All of this should happen at taxpayer expense.

Of course “Just in Time” is not heard all that much these days because it is now so embedded in corporate lifestyles that it goes without saying. The natural response for a peasant who decides to stop growing his own onions is to buy someone else's and stash them away. Likewise the correct response to GE no longer owning stakes in Tungsten mines (to provide light bulb filaments) would be to fill warehouses with enough Tungsten to ensure it could ride out price spikes and supply disruptions. Wall Street would chastise such a strategy as “excessive inventory build”.

The advocates for the strategic stockpile option would claim its aim is to ensure that the government has a supply of REE (or whatever) for when it needs it. But governments never need REE themselves because they procure all their military supplies from suppliers. It is the suppliers who must buy and stash the stuff or, perish the thought, invest in mines upstream (or finance them) that would ensure that there are orderly markets and adequate supplies of their raw materials. The US and other countries do not need taxpayer supported strategic stockpiles, they need commercial accumulation of adequate supplies.

Presumably when the Navy signs an agreement with a supplier for a new missile system, the supplier has to commit to have spare parts almost immediately available in any circumstance. That is relatively easy for the supplier to commit to. He has control of his manufacturing process (or at least thinks he does). But can the supplier also commit to ensure that the raw material inputs for the spare parts are available to keep the supply chain intact and make good on the supply commitment. The GAO report made clear that SNAFUs are already appearing in the works and no adequate response is available to explain why if China were to ban all non-elaborated heavy REE exports tomorrow then there would be NO and we mean absolutely no alternative supply. It reminds one of those old World War Two movies where undercover agents from all sides were trying to get their hands of the unique “heavy water” from Norway. Having only one source is fatal...

The point we would emphasize here is that it is the commercial sector’s interest to ensure it is adequately supplied. If a small copper wire maker were to run out of copper because he had not ordered enough, or stored enough or not ordered sufficiently in advance to ensure continuous supply for his needs then he would be called a bad businessman. If a major multi-billion dollar defense supplier that charges over the odds for everything that it supplies to the government fecklessly runs out of Samarium for magnets in a guidance system then it is because a.) the government got rid of its stockpile or b.) the evil Chinese dominate the market. Who is trying to kid whom here? Even the steep cost of building Avalon’s Thor Lake mine is chump change for Northrop Grumman. GE could buy Great Western Minerals for the price of one of its corporate jets.

Defense contractors heal thyselfes.

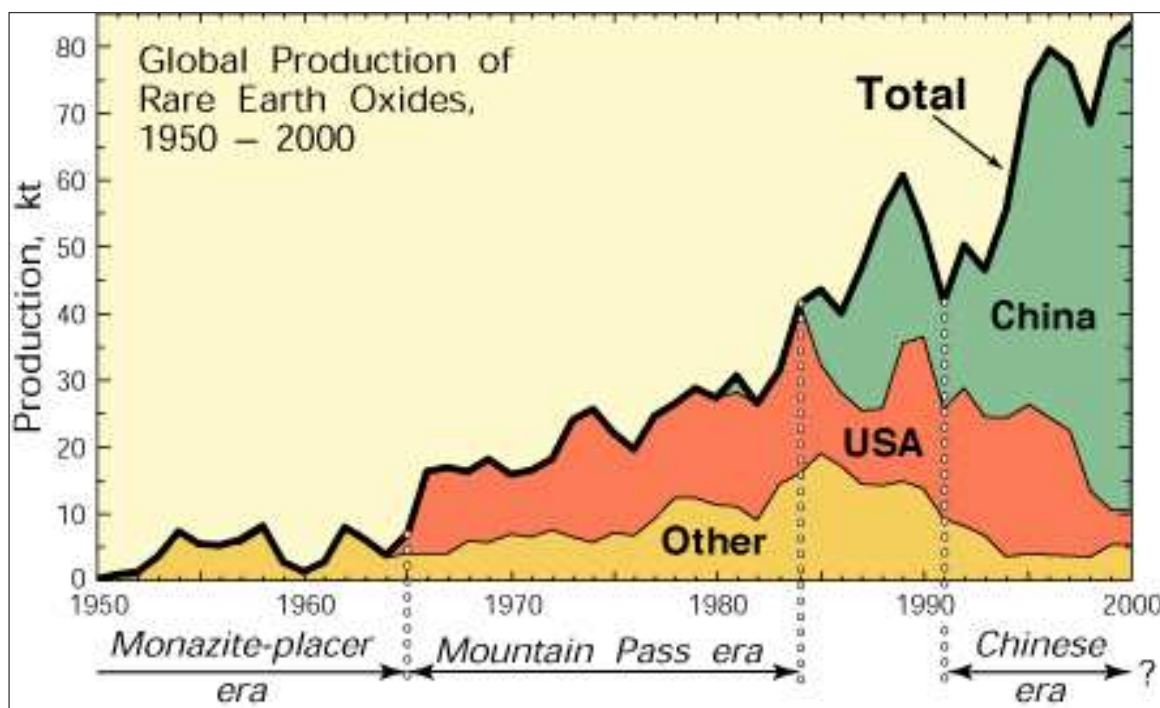
Goldilocks – fingers in the porridge yet again?

For a firm with the mythical prescience of Goldman Sachs we found it very hard to believe that it had sold out of Molycorp (and surrendered its board seats) just a few weeks (announced March 26) before Molycorp was throwing itself back into the equity markets with what should be a stellar debut. This is not the sort of money-making opportunity that Goldman is known to miss. One might well wonder how GS gets to have its cake and eat it too. Obviously bringing the deal to market and being one of the controlling parties at the entity is a conflict of interest that might be worked through but with conflicts of interest being the buzzwords of the moment that might not be politic. Then again there are ways of exiting a PE situation and still have a kicker from the buyer to the vendor based upon “post-IPO performance”. And yet Goldman is not shown as the organizers on the SEC filing (this role falls to JP Morgan and Morgan Stanley). Curiouser and curiouser...

According to Bloomberg, Mark Smith, Molycorp’s chief executive officer said: “From a Goldman standpoint, it was a small investment and one of the issues that they had and I think the primary reason

for their sale was that they were not in a majority position.” Oh yeah? With a possible billion dollar market cap in the offing since when has Goldman not been content to be a minority in a PE investment? Interestingly Smith declined to say how much of the company Goldman had owned or provide a sale price. Inscrutably, Ed Canaday, a spokesman for Goldman Sachs, confirmed the sale of the stake and declined to comment further. Smith said that Goldman Sachs sold its shares in Molycorp to the existing shareholders, which include Resource Capital Funds (controlled by the Rothschild interests), Pegasus Capital Advisors LP and Traxys North America. The sizes of the other partners’ stakes were likewise not disclosed.

The strangely misnamed Molycorp owns the Mountain Pass mine in California that once provided over 40% of the world’s REE production and consequently was the world’s largest producer of rare earths until it was overtaken by Chinese producers with their rock bottom pricing during the 1980s.



Source: USGS

The era of US dominance of REE is described as the Mountain Pass era that pretty much sums up the total dominance that this mine had over US production. While the chart shows this mine starting up in the mid-1960s, it actually came into production in 1952. It is clear that it also made up to 40% of global production during that period. It was owned for much of that time by Union Oil Co (later Unocal) and this eventually was taken over by Chevron. The private equity partners apparently bought in for around \$80MM in 2007.

The mine was always Europium-rich. This is the element that provides the red-phosphor colour in television screens and monitors. It has a specialized Europium plant, the only such facility we have heard of. Molycorp maintains a joint venture with Sumitomo Metals, called Sumikin Molycorp, which markets rare earth products in Asia and produces permanent magnet materials in Japan. Molycorp is based in Greenwood Village, Colorado.

The mine ceased removing ore from its open pit in 2002, and Molycorp has continued some production from existing stockpiles of ore. It is said that the company plans to raise \$450 million to \$500 million to restart mining, arguing that growing demand and Chinese export restrictions will create shortages.

The story is slightly more complicated than the Chinese just undercutting US prices. The Mountain Pass mine is relatively thorium-rich which presents a slight problem. However the company was long underinvested and had a pipeline leakage in the desert that was the final straw. The mine needed some serious investment to get into top form and Unocal were not prepared or able to make the capex spend required. Instead they sold off all the mine equipment. Monetizing underutilized assets – music to Wall Street’s heart.

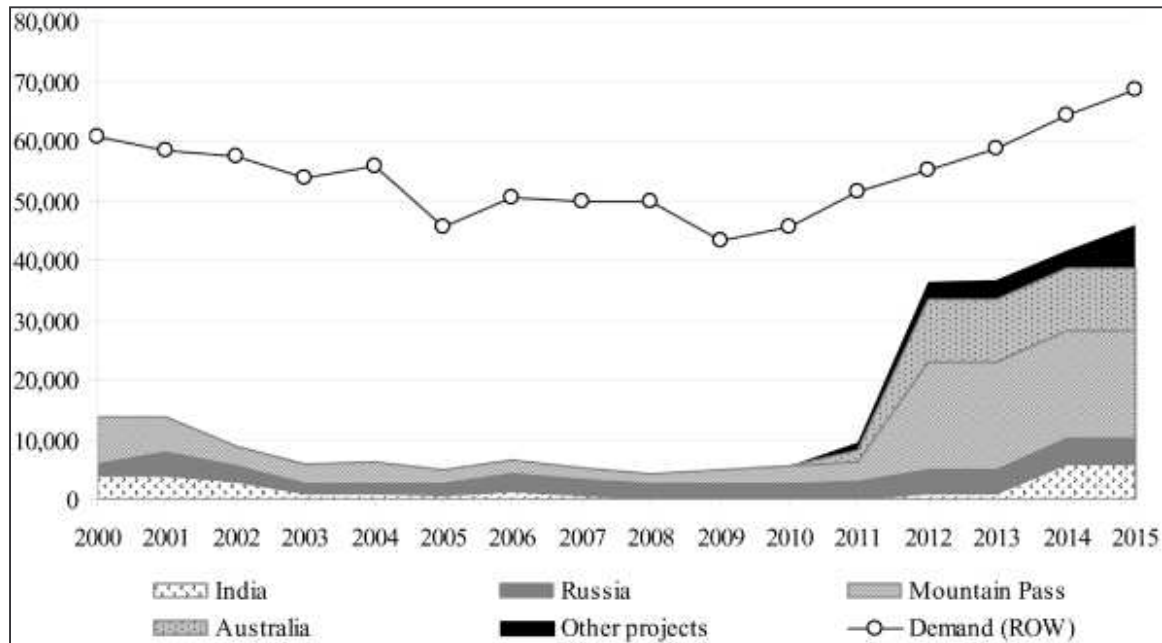
While Molycorp has doodled along processing stockpiles it has not been as static as might be imagined. Originally Great Western Minerals (GWG.v) came to our attention in March 2009 when it was subject to a non-binding letter of intent wherein Molycorp would acquire a controlling interest in GWG pursuant to a share issuance, merger, amalgamation, or other form of business combination. At the time Great Western had binged on its acquisition of Less Common Metals Limited, located in Birkenhead UK, on which it had a substantial debt commitment. The company also owned Great Western Technologies Inc., located in Troy, Michigan, which produces a variety of specialty alloys for use in the battery, magnet and aerospace industries. These "designer" alloys include those containing copper, nickel, cobalt and the rare earth elements. Beyond these Great Western has offtake agreements and purchase options on the mothballed Steenkampskraal REE mine in South Africa and various Canadian REE exploration properties.

At the time, Mark Smith of Molycorp said, "We are excited by the benefits and opportunities that this transaction will provide by combining the operations of our two companies. This transaction represents the next step in Molycorp's strategy of going from mine to magnets and will immediately provide Molycorp with access to the technology, people and facilities to take the rare earth materials produced at Molycorp's Mountain Pass, California operation and further refine them into the rare earth alloys that are necessary for production of high power magnets and other rare earth materials..".

Rather abruptly on June 15th of 2009, Molycorp announced it had been unable to reach agreement and had let its interest in GWG lapse.

Despite denying an interest in an IPO it issued us and other analysts a visit to the mine early in 2010 and held a presentation at Bloomberg’s head office in NY for all interested parties. Now we have the IPO revealed. If the company comes to the market with a valuation of \$1 billion then the partners have turned \$80MM into \$650MM. Is this the type of gain that Goldman leaves on the table “because it is so small”?

The initial filing for the Molycorp IPO is now out on EDGAR and makes some interesting reading. With our tendency to laser beam in on a few details the chart that told more than a thousand words was this one:



Source: Roskill

This assumes that Mountain Pass will supply a substantial part of increased production after 2011. This signals that they believe they can ramp up rather rapidly and that there are no environmental or logistical stones in the road. If they did think there were any then this chart should not have been employed in the filing.

However present reality is far from this soaring projection. As we noted the IPO is being mooted to value the company at \$1 billion or above. For the year ended December 31, 2009, however, Molycorp only generated approximately \$7.1 million of revenue from sales of products manufactured from stockpiled feedstocks. This makes the launch-pad for Molycorp more similar to a tech IPO in 2000 than the typical IPO of recent years that has required substantial track record on earnings to get traction.

Molycorp in conjunction with SRK Consulting are estimating that Molycorp's total proven and probable reserves are:

- ❖ 2.21 billion pounds of REO
- ❖ an average ore grade of 8.24% (using a cut-off grade of 5.0%)
- ❖ an expected annual production rate of 19,090 mt of REO
- ❖ an expected mine life is in excess of 30 years
- ❖ capability to increase production to 40,000 mt of REO per year

According to the consultants Roskill, global REO production in 2008 was approximately 124,000 mt, of which only approximately 4,300 mt originated from outside of China, with Molycorp producing approximately 1,700 mt from its stockpiles and Russian producers producing approximately 2,500 mt

and the rest being India and Brazil. This contrasts with total demand outside of China in 2008 of approximately 50,000 mt, according to Roskill.

Amongst the other gems in the filing is the strategy revelation that Molycorp, beyond selling a portion of the REOs it produces to customers for use in their particular applications, it intends to process the remainder of the REOs into rare earth metals. A portion of these metals will be sold to end-users and it expects to process the rest into rare earth alloys. These rare earth alloys can be used in a variety of applications, including but not limited to: electrodes for NiMH battery production; samarium cobalt magnet production; and NdFeB magnet production.

Initially, Molycorp's plans envisioned adding facilities and equipment for metal conversion and alloy production at the Mountain Pass facility but now it has "..... entered into a letter of intent to acquire a third-party producer of rare earth metals and alloys in the United States". This leaves us wondering if the GWG plans have been dusted off. The company then claims that if it completes the acquisition then it plans to transport cerium, lanthanum, neodymium/praseodymium (didymium) and samarium oxide products from our Mountain Pass facility to the acquired company's off-site location that already possesses the technological capability to produce rare earth metals and alloys.

It also confesses to be currently evaluating joint venture opportunities to integrate downstream into NdFeB magnet manufacturing in the United States.

The "metals" (really elements) mix at Mountain Pass is as follows:

Element	Estimated % of Bastnasite Ore
Cerium	48.8 %
Lanthanum	34.0 %
Neodymium	11.7 %
Praseodymium	4.2 %
Samarium	0.79 %
Gadolinium	0.21 %
Europium	0.13 %
Dysprosium	0.05 %
Other REE (including Terbium)	0.12 %

Mountain Pass is a LREE whipping boy for the HREE wannabes who constantly refer to its poor HREE grades. However, when it comes down to it, it is the Europium and Dysprosium that really matter from the HREE group and Mountain Pass will be turning out 19 tonnes per annum of Europium, a most respectable amount (at Roskill's estimate of \$600 per kg) by 2013 when most of the HREE wannabes will still be doing nothing more than flashing their powerpoint presentations at unwitting investors.

Interestingly the company claims to have Letters of Intent for around 24,700 tonnes worth of production and a projection of 17,898 tonnes of output in a range of REEs in 2013. This implies it is potentially "sold-out" so those who would want the US government piling up stocks for a rainy day would also, by implication, be advocating that the government out-compete private sector buyers of REE from

Mountain Pass. We would add a caveat that of the 17,898 tonnes, some 15,300 tonnes are the “cheapie” LREEs, Lanthanum and Cerium. This is inevitable in any REE mine in contrast to the fancies of HREE wannabe miners who would have us believe that they can have their dysprosium and not have to extract the relative dross.

The One that Got Away

It doesn't take a particularly long memory to remember the move on Unocal by CNOOC back in 2005. The bid ultimately withered in the face of a determined anti-Chinese campaign orchestrated in Congress. The surprising thing was that the Chinese went for the second line oil company and that they were so persistent in pursuing their target over so many months. At the time our remit included second tier US oil companies and we had found the pursuit of Unocal inexplicable and somewhat quixotic. But then again neither did we know anything of Rare Earths at that time nor did we or very many others know that embedded deep in a dusty corner of Unocal's holdings was its ownership of Molycorp and its Mountain Pass mine. It is very tempting indeed to think that the Chinese knew of this asset. Why wouldn't they? One can merely speculate on what the motivations might have been. Owning Mountain Pass and putting it into production might have focused attention if their bid ultimately had been successful. Selling the plant for scrap and leaving the mine for tumbleweeds and the history books might have been a more effective strategy and somewhat consistent with the scorched earth policies we have seen elsewhere.

More intriguingly it rings a certain alarm bell. If CNOOC was indeed after Mountain Pass and either exploiting it or neutralizing it for the “greater strategy”, when CNOOC is not an obvious REE player, then it behoves authorities everywhere to look at the actions of even the most obscure Chinese gambit player in the light of what might be the grander plan directed from a ministry rather than a board room. After all, if the State company that exploits Bayan Obo had bid for Unocal then the intentions would have been patently obvious. Clearly the Australians did as much last year when they blocked the Chinese (China Nonferrous Metal Mining) majority stake in Lynas and limited the stake in Arafura to 25%.

Magnet makers triumphant?

Well may we ask the question on where the real impetus for the GAO report has come from. We were solemnly informed that the down and out magnetmakers of Indiana had sparked the Congressional feeding frenzy on REE and US dependency on China. Hmmm..

This hardy group reminds us more of the frog in the boiling water rather than the lobby group par excellence that are made out to be. Battered and bruised by nearly 30 years of the Chinese eating their lunch we are surprised to hear that they have such remnant oomph to send legislators into a tizzy in their defense. Then within days of the GAO report out comes Goldman's IPO of Molycorp. Say no more...

Conclusion

There is a supply crisis looming in the Rare Earth space and Mountain Pass is only going to make the rationing less severe rather than ameliorate it. The US defense industry (and other users) have only themselves to blame for going for “cheap” over reliable since 1982. When it comes down to it the US REE capability was sacrificed on the altar of cheap chisellers in one of the most well-padded sectors in

the US economy, if they can be even said to dwell in the real economy. They dropped the ball and now seemingly want the government to make it right. More will be needed than their gum-flapping... and that of the politicians. In the land of the procurement of \$180 toilet seats paying “too much for US-produced REE inputs should not have been an issue. Now the price to be paid should be significantly higher. They are even suggesting the government should compete with the private sector to buy the limited non-Chinese portion of the supply of REEs.

Clearly it is time to hold the suppliers of defense infrastructure responsible for their own short-sightedness. If Toyota wants lithium it takes a stake in Orocobre or commits at least to take the offtake. Glencore does likewise in the products it wants. Why can't the US defense contractors make rain, metaphorically speaking, by providing some moisture to the REE ecosystem?

The government at this point does not need to spend one cent of REE production or stockpiling for all it needs to do is write into contracts that there will be big (read massive) penalties on suppliers for not being able to supply equipment due to what are frankly highly foreseeable supply issues in the REE space (and beyond that in a swathe of other specialty metals used in defense infrastructure). If suddenly a fistful of the top defense contractors are getting positioned in the REE upstream then GE and GM et al, should start being afraid that they will not be able to secure what they may want. Likewise for the more obscure names out there who tout their green economy products in wind turbines and solar panels but have not done anything to secure their supply of key ingredients. They should look at the Indiana magnet crowd to see what fate awaits them if they don't “secure their upstream”.

In summation the GAO report is a catalogue of China-dependency and unpreparedness while the Molycorp IPO is possibly the first step on the road back from this parlous situation.

Rare Earth Elements

														Y 39			
La 57	Ce 58	Pr 59	Nd 60	Pm 61	Sm 62	Eu 63	Gd 64	Tb 65	Dy 66	Ho 67	Er 68	Tm 69	Yb 70	Lu 71			
Lanthanides																	
H														He			
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	An	Lr														

Tuesday, April 27, 2010

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