

Tasman CEO on the nepheline advantage from the Norra Karr heavy rare earth project

December 29, 2015 – In a special InvestorIntel interview, Publisher Tracy Weslosky interviews Mark Saxon of Tasman Metals Ltd. (TSXV: TSM | NYSE MKT: TAS) about the recent completion of a magnetic separation pilot plant for the Norra Karr heavy rare earth project. Mark explains that what they found in the course of their results was a way to commercialize the nepheline by-product. “The work we’re doing now is to get the nepheline into markets so we can understand the value...” and continues “the aim there to have a very low-waste mine or even a zero waste mine if possible.”

Tracy Weslosky: Mark you just recently put out some news about the completion of a magnetic separation plant for the Norra Karr heavy rare earth element project. Can you tell us about this news?

Mark Saxon: Yes, thanks Tracy. We just finished making a separation pilot plant. That was to do a scale up test of our beneficiation process, which for Norra Karr is mainly separation. That was a test run in Finland. It was paid for by the European Commission under our EURARE project. It performed very well. We’re very pleased with the results.

Tracy Weslosky: In addition to that there was something that I thought was very interesting in your news release. It said you’ve managed to take what was previously deemed waste product, nepheline by-product, and you found a way to commercialize this. Could you start by explaining to us at InvestorIntel and maybe the rest of our audience an understanding of what you have here? This sounds exciting.

✘ **Mark Saxon:** Yeah most of it is. It's a little bit different to what most companies are dealing with. In fact, the Norra Karr project was first worked by a Swedish mining company, Boliden, for nepheline rather than for rare earths. It's had quite a long history there. Nepheline is a mineral. It's not a metal. Nepheline will go into the ceramics industry, the glass industry. It can go into cosmetics. It can go into building fillers. It can go into many end-uses. Europe is a very large market for nepheline. When you think of roof tiles and bricks and when you think of Italian ceramics or Spanish ceramics all of that is using nepheline and so it's a very large market. For the rock at Norra Karr about 65% of the material in the ground is in fact nepheline. The work we're doing now is to get the nepheline into markets so we can understand the value of that in particular, but also understand the environmental benefit it could have as well because it is using our waste material. We've got the aim there to have a very low-waste mine or even a zero waste mine if possible.

Tracy Weslosky: So if we can just go back to the results, it seemed to me based on your comments in the news release that you were very pleased with the results. I think you said that it mirrors the bench scale test work. Can you tell us a little bit more about what this actually means? To access the complete interview, [click here](#)

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MoLycorp – The Great Rummage

Sale begins

✘ It is sometimes said that after a nuclear holocaust the only lifeform that will survive will be the cockroach. That said there are some hardy cockroaches indeed in the Rare Earth space. Indeed some managements must be almost masochistic in persevering despite the opprobrium heaped upon the metals they pursue and their own companies. Nevertheless Darwinian forces are at work and the original 200 plus Rare Earth wannabes have shrunk to a couple of handfuls. These are definitely the cockroaches..

But one may well wonder whether it is much fun to live in a post-nuclear world. What is the future for the survivors?

All the Right Pieces in All the Wrong Places

The US Rare Earth “giant”, Molycorp, is now a wounded beast and is going down fast. The hyenas are circling and the question is what value can be rescued from the ruins.

In popular imagination Molycorp is a mine with a processing plant, but long before that it was an agglomeration of assets including some small manufacturers scattered around the globe and some larger assets such as the Silmet plant in Estonia. It then transformed itself with the pricy purchase of Neo Materials which brought it a processing and distribution Empire which also included assets in other metals, such as Gallium. So while the Mountain Pass mine itself may have gone the way of the dinosaurs, and much of the costly infrastructure around it appear redundant, there is still value to be rescued from the broader Molycorp empire.

As we well know the Neo Materials entity did very well all by itself in the Great Rare Earth Boom. It did not need to be vertically integrated with a mine (though there are some arguments that it may have inevitably been forced into that if China has applied the thumbscrews). However the Molycorp

merger resulted in it being part of the same corporate grouping as a mine but was it actually vertically integrated? Was Silmet vertically integrated with Mountain Pass? Silmet's raison d'être was to process product from the Loparite mines in Russia's Kola peninsula, not to take product from the Californian desert.

We have all played Monopoly at some time or another with one of those players that buy whatever property they fall upon and they end up with a ragbag of assets and no sets of properties that you can take further (i.e. build houses or hotels). Molycorp's strategy was akin to this. It had some interesting "bits" of the global Rare Earth equation and while Neo Materials was like Monopoly's Park Lane card, Mountain Pass was definitely more like the Old Kent Road card.



So what might play out here? Clearly Mountain Pass is likely to return to being a playground for rattle snakes and jackrabbits. It is a great shame that so much above-ground infrastructure is there that shall be surplus to requirements. It has long been my contention that Molycorp should have had a second string to its bow in the form of a smaller Heavy REE focused mine somewhere. If it had done this then the existing processing facilities could have been utilized, repurposed and/or relocated to service a new mine with a more market-amenable REE mix. Instead we have a sizeable plant in the wrong place, designed for the wrong REE mix and arguably way over-sized for whatever "new" REE mine might be able to supply it.

So Who Gets What?

The emotions of Molycorp management must be torn. Most coming from the old Neo Materials are probably wondering how they can get their hands on their old assets and ride off into the sunset. Possibly even Silmet and the other "early"

acquisitions of Molycorp could be bundled with the Neo Materials processing and distribution network and make some sense. Ideally a private equity firm might back the escape bid giving the MCP debtholders some "widow's mite" to, in some small way, compensate them. The question though is what happens to the mine (essentially useless) and the plant at Mountain Pass. This is where opportunity knocks. But it is also a test of the credibility of the remaining REE *cucurachas*.. We could conjure with at least 4-5 names that could "do something" with the MCP mill and plant, if only their own projects were in a state to move forward. Even more critically though the managements would have to be serious about becoming producers. Conceivably an owner of a North American REE mine project could make a case to the debtholders for knocking together their mine with the Mountain Pass kit and making a more viable concept than the original Molycorp proposition. Why are they not stepping forward for this once in a decade opportunity?

On other fronts, the Silmet asset is looking vulnerable with its Russian supply source exhausted and its US "source" (even if merely theoretical) being shuttered. Then what to do...? The answer is for a combine between Tasman with its Norra Karr deposit in Sweden and the Silmet plant just across the water. Will this happen? We doubt it.. makes too much sense..

Conclusion

Rare Earth assets may be at giveaway prices these days and Molycorp may look like a doomed wildebeest, but there is material here to make a silk purse out of a sow's ear. The core Neo Materials assets are largely intact within the stricken corporate shell and the secret is going to be to apply some financial wizardry to liberate them without letting the debtholders realise the value of what they have. Even the rump Mountain Pass processing operations could be combined with an existing project and given renewed life force. Silmet is somewhat more problematical but a combine with a European-

based REE wannabe could give both parties a well-needed fillip.

Fortune favours the bold and the travails of Molycorp are producing a unique opportunity to other Rare Earth players to become hyenas and pick over the bones for tasty morsels.

Ecclestone on mining in Albania

Albania – Not Quite the Land that Time Forgot: In the not too distant past, with one of my other hats on, I was very involved with the mining scene in Albania. At the time I headed a company that desperately needed to diversify away from the mammoth country risk involved in doing business in Turkey (therein lies another story) and my glance turned to Albania for a couple of reasons. Firstly it was a country with a very strong mining history (in fact its fate post-WW2 was directly linked to mining). Secondly, its major resource was chromite, for which I have a particularly soft spot (as evidenced by my recent writings on Tasman's diversification into this metal). Thirdly it is geologically governed by the Eastern Ophiolite Belt which is a spur of the great Tethyan Copper Belt that stretches from the Carpathians in Slovakia, all the way through the Balkans, across, Turkey, Iran and ending in Afghanistan or Pakistan depending on your point of view.



I am more conflicted as to whether it is a positive or negative for the country that it is not currently a member of the EU.

Some Background

Albania, with a population of approximately 3.5 million people, has had an open market economy since 1991 though the country's potential (mineral and otherwise) remains largely untapped. The population of Albania is relatively young, (average age of 32) and the majority of people speak English, Greek and/or Italian. There is an ongoing effort in the country to improve infrastructure, sanitation facilities and wealth creation amongst its population as part of an overall bid to eventually join the European Union.

Mining in Albania

Albania's mineral deposits included chromite, copper, ferronickel, limestone, and petroleum. After WW2, Communist state-run initiatives to mine became a priority.

Under central economic planning, especially from the late 1970's through 1990, Albania's chromite mining operations were among the most important components of the mineral industry. Indeed such was the strategic importance to China of Albanian chromite that the Chinese courted the Albanian *supremo*, Enver Hoxha, and managed to peel Albania off the Soviet Bloc and Albania was, for decades, a Chinese satellite rather than a creature of Moscow.



Albania had also been a producer of copper and nickel since the 1930s. Collapse in mining production of chromite, copper et al. followed the demise of the Communist regime and mining has been made into a priority by recent governments as a means to create jobs and export income.

In 1995 the Albanian government adopted a law to privatize the mining industry. Administrative preparation began in 1996 and to date the government continues to grant exploration concessions to international companies and individuals.

In cooperation on environmental issues, Albania participates in the Basel Convention on hazardous waste, the convention on biological diversity, and UN Conventions of the Law of the Seas on climate change.

Chromite – Not What it Was

During the Sinophile period, Albania was a leading world producer and exporter of chromite and often was ranked second in terms of export (after South Africa) and third in terms of production (after the former South Africa and former Soviet Union). The export of chromite and ferrochromium also was among the country's chief sources of foreign exchange.

Although chromite deposits and outcroppings can be found throughout Albania, the principal commercial chromite deposits are in ultramafic massifs in the Midrita region, in the north-central and northern parts of the country. The mainly podiform ore was mined at seven mining districts, of which Bulqiza and Batra, about 30 km northeast of the capital, Tirana, represented about two-thirds of Albania's total production capacity. Albanian chromium ore grades from 18% to 43% chromium oxide (Cr_2O_3). The lumpy ores grade 39% to 42% Cr_2O_3 and the concentrates grade from 50% to 53% Cr_2O_3 . About 25% of the ore was suitable for direct shipment; the balance was divided equally between beneficiation and shipment as feedstock for the Burrel ferrochromium plant. In the late 1990s production was in steep decline as evidenced when in 1999, the production of run-of-mine chromite declined by 47% compared with that of 1998; the production of such marketable products as chromite concentrate, direct shipping chromite, and ferrochromium fell by 66%, 21%, and 7%, respectively.

Advantages & Pitfalls

A couple of important things should be noted here that I (and others in the mining space) learnt through experience rather than a website. Firstly, we need to look at the country in the

context of it being essentially a backwater from 1950 (well, even more so before WW2) until the communist states fell in the late 1980s. Albania like every true socialist republic churned out geos like there was no tomorrow and with little consideration of the economic need for them. With all these skills and not many mines for them to work in, they were put to work scouring the country to find each and every mineral deposit. No stone was left unturned for forty years and thus I would be as bold to say that it is probably the most thoroughly explored country on the planet. Not bad for Europe's only Third World country. The upshot of this is that when the government has its regular license auctions or tenders it produces very exact and very delineated properties for PRODUCTION. Thus a tender might read 175 hectares with a chromite resource of 25,760 tonnes of Chromite grading 46.3%. There is no fat or spare land on these production concessions. You can be pretty sure that the terms of what you bid for is what you get. Therefore you are also expected to get cracking and start exploiting what you have just bought as the tender usually contains a specified work commitment in Euros (and exploration is NOT work). You can hear Canadian promoters shuddering at the thought of all this transparency. There is not even a figleaf behind which a Vancouver promoter can hide when these deposits are so WYSIWYG.

Secondly, there is a rule in Albania that you must surrender half your territory, if it is not a production license, after a relatively short period of time. Then after that you must surrender another half until you eventually are on a shrinking island in a rising sea. This is all well and good for it is *use it or lose it*. This all comes together in the third point and the grand maxim. Because of the first point, most deposits in Albania are known. Thus Canadian and Australian miners who want to "reinvent the wheel" by making a discovery and spending large amounts on a drill program are wasting their time. The maxim is that Albania favours the producer over the explorer. The explorer is doomed to find something and then

lose it. We heard of one case where a certain amount of exploration had been done and obviously that would be the part the concession holder would want to keep and give up another part. Instead some Chinese interests came in and offered somebody in high places some persuasion and the explorer was left with a donut AROUND the territory they had worked. If this story is not apocryphal, then it would seem that, contrary to practice in other countries with “give-up” rules, here it is NOT the company that gets to decide which half of the acreage it gives up.

The Players

One of the first players into the Albanian chromite space was London’s Anglo-Pacific group that picked up some prime mines that had formerly been producers for the state mining entity. It then vended those on to Robert Giustra’s Empire Mining (which is now called Columbus Copper). Things were going well there with a very short timeline to production (less than a year) until rather suddenly ownership issues reared their ugly head. This totally derailed Empire’s production plans and stymied financing, while both mine-financing and chromite prices went soft. Eventually legal hearings resolved the issue but Empire had already moved on to greener pastures.

My own experience was in the putative takeover of a TSX junior that had a swathe of interesting chromite and PGM-chromite properties plus a gold property. Here we found that the “give-up rules” were looming over several of the properties making them rather binary as to whether they had any residual value or not, or what part of them one would be left with. We worked out it was cheaper to go to the tenders and acquire proven acreage rather than speculative territory.

The veteran player in Albania that has stood the test of time is Tirex, a company which we have known, and admired, for what is a long-time in what we might call “mining-years”. Here though is not the place to discuss their progress at length.

Kosovo

Ask an Albanian about Kosovo and they will comment "Greater Albania". No-one would deny that most of the population of Kosovo are in fact Albanians but because of the vagaries of history (and the US wariness of redrawing borders) the Kosovar Albanians were first embedded in Yugoslavia and now have their "own" state which they share with a Serbian minority (and some Macedonians and Bulgarians).

As for the geology, Kosovo is also somewhat of a mixture of Serbia and Albania. It has a lot of mountains but also has substantial valleys and foothills whereas Albania is almost all mountainous. It's the northern part of Kosovo that is most interesting where it borders Serbia and has a substantial history of base metal mining, Lead/Zinc and Copper, particularly around Trepca. Avrupa Minerals have a base metals project in Kosovo, the Trepca region.

Conclusion

Despite the pitfalls of my abortive acquisition I ended up starting an office in Albania to act as a listening post for upcoming auctions and to keep an eye out for potential targets in Albania, and Kosovo. The area remains as prospective as ever and no-one can point to any overt regulatory debacles to totally dissuade miners from heading into the fray. The problem is more the malaise in mining, than any malaise in the target country.

We are surprised that so many have been surprised by the success of Reservoir Minerals and its efforts in neighboring Serbia. We liked the prospects of this story since we first encountered it. The Balkans are all about fascinating geology from the historic gold mines of Greece and Romania, all sorts of base metals from Serbia and Bulgaria, Antimony in Serbia and Kosovo and the chromite riches of Albania. Other names to conjure that are exploring in the region are Euromax Resources

(with interests in Macedonia and Serbia) and Pan Global Resources with its Lithium/Borates project in Serbia.

The region however is not for the faint-hearted, and particularly in Albania, this is a country where one has to go in eyes-wide-open and no delusions whatsoever.

Tasman – Taking the Rare Earth High Road.

It is said that Michelangelo had the ability to see a large block of raw marble and view the eventual statue as something akin to a figure “trapped inside the stone” that only needed his hammer and chisel to set it free. The hot off-the-press PFS on the Norra Karr project reminds us of that block of marble with a David trapped inside yearning to be set free.

While most about them are cowering in the fall-out shelters waiting for the nuclear winter in the REE space to end, Tasman Metals Ltd. (TSXV: TSM | NYTSE MKT: TAS) have been forging ahead with their Norra Karr project, hoping to bring the project to fruition as the premier European REE producer.

This week’s PFS publication gives a roadmap of one way to get where the company wants to go with this project. Now it’s time to turn on the GPS and find the shortest, fastest and most fuel efficient way to get from A to B rather than taking the consultant’s “scenic route”.

The main salient features of the PFS are:

- After-tax Net Present Value (NPV) of US\$313 million using a 10% discount rate

- Internal Rate of Return (IRR) of 24% pre-tax and 20% after tax using a 10% discount rate
- Initial capital cost of US\$378 million including contingency
- Major exposure to the most critical REE's, with 74% of revenue from magnet metals Dy, Nd, Pr, Tb, Sm
- Project able to produce more than 200 tonnes of dysprosium oxide per year for at least 20 years
- Unconstrained mine life is in excess of 60 years with extensive mineralization below and along strike from 20-year pit

Norra Kärr

The Norra Kärr project located approximately 300 kms south of Stockholm. The project is near the towns of Jönköping and Linköping, from whence would come the required workforce for the mining operations.

The property was initially discovered in 1906. It was explored by the Swedish mining giant, Boliden AB, for nepheline in the late 1940's, and for Zirconium and Hafnium in the 1970's. However it was relinquished in 2001 and data from these previous efforts was only made available in 2009. The Swedish government declared it to be a "Project of National Interest" in 2002 which prevented conflicting land use.

Tasman claimed the ground in mid-2009 and first drilling began in December 2009 with a goal of proving up a heavy rare earth and zirconium resource. The deposit now has in excess of 100 holes amounting to around 12,000 metres. The first NI43-101 compliant resource was released in November 2010 and an updated PEA came out in July 2013.

The Norra Karr REE deposit, as modelled in this PFS is a single body of mineralization, some 300m x 700m in size at surface, which begins under 0.5m average of soil cover. The mining method envisioned in the PFS is conventional open pit

mining with a single simple open pit that will extend from surface to a maximum depth of 160m. This is expected to have a constrained 20-year life of mine and a stripping ratio of 0.73. It is anticipated that average annual tonnes of ore mined would be 1.18 million while waste rock mined would be 0.84 million.

The Capex

The fatal flaw in all REE projects these days is the capex. That of the Norra Karr project according to the PFS is a chunky US\$378mn. It also estimates that an additional US\$44.3mn will be required during the life of the project in sustaining capital. The breakdown of the capital items is shown in the table below. We would have liked to have seen more granularity in the omnibus "Process & Tailings" number so we could parse its individual constituents and compare against other projects.



Mining is admirably low and the infrastructure spend is kept down due to the facility's well-serviced location. As usual with the consulting crowd they have liberally larded the budget with padding to make sure there is no blowback in their direction. It's now up to management to mark the consultants' performance report with "can do better" and show them how to get the budget in at a much lower figure that is financeable in the current tough environment. If any REE company's management are up to the task of coming up with a better plan, then it is the very hands-on and practical crew at Tasman.

A Baltic Combination?

As we have said before Tasman remains one of the prime takeover (or better, merger) targets in the REE space. The deal that strikes us as most obvious is some sort of arrangement with the 800-lb gorilla in the REE space,

Molycorp. The rationale behind this one is simple in that Molycorp owns the Silmet processing plant in Estonia which used to source the bulk of its material from the Russian loparite mines. With those mines in a state of decay, the next obvious source with reasonable proximity is Norra Karr with a rather short maritime voyage away. Molycorp is not in the healthiest of conditions itself these days, but should it survive this current swoon then the synergies between these two assets are pretty clear. It would be interesting to know what sort of savings on the Tasman capex might be able to be achieved by exploring this possibility of a tie-up.

Conclusion

There is an old adage that those packing for a trip should pack the suitcase and then throw half of the stuff out of the suitcase. Having spent years watching the machinations of mining consultants with their ass-minding, fee-generating ways we have come up with our own spin that one should take a capex number, halve it and then get the consultants to justify every cent when growing the number again. The on-going use of sizeable contingencies (20% in this case... though down from the 25% fashionable a couple of years back) shows that the mining industry is yet to grasp the concept used in building a McDonald's store that the project must come in on budget.

We have resolved to finally retire our old REE mantra of chemistry, chemistry, chemistry and replace it with right-sizing, right-sizing, right-sizing. The current projected capex at Norra Karr is a good starting point for revisionism. While the capex number is not one of the largest numbers out there, if one takes away those projects (which shall go unnamed) that have now being *sotto voce* mothballed, Norra Karr ends up "out there" at the higher end of the unbuilt projects that remain viable.

In light of the uber-competence of the management group at Tasman (and sister entities) we would not be surprised to see

the consultants sent to stand in the corner with the dunce's cap on to rethink what they have come up with and right-size the PFS as the basis for the DFS and actual building.

Hopefully in the meantime some reconfiguration of the assets of Molycorp could create a combination with Tasman on the shores of the Baltic that makes Tasman the *primus inter pares* in the mammalian survivors of the Great Extinction Event, which will see Lynas and Molycorp marched off to the dinosaur hall of the Natural History Museum.

Ecclestone on Tasman Metals: Dedication to rare earth production and a Zirconium 'kicker'

Ancient Greek and the Scandinavian region have been the inspiration for most of the names of the elements in the Lanthanide series of the Periodic table. Ancient Greek is a perennial for naming elements but Scandinavia came into its own with Rare Earths grouping because of the "discovery" of Rare Earths in Sweden back in the 19th century. Amongst those elements with Nordic nomenclature we have Terbium, Yttrium, Scandium, Ytterbium, Gadolinium, Holmium. Thulium and Erbium.

While Tasman Metals Ltd. (TSXV: TSM | NYSE MKT: TAS) is the leader in Scandinavian Rare Earths, it and its quasi-sister company Flinders have been named by their antipodean progenitors after famous explorers of the Great South Land, providing a paradoxical link between global extremes.

Norra Kärr

☒ Tasman's main target, if one needs reminding, is the Norra Kärr project located approximately 300 kms south of Stockholm. The project is near the towns of Jönköping and Linköping, from whence would come the required workforce for the mining operations.

The property was initially discovered in 1906. It was explored by the Swedish mining giant, Boliden AB, for nepheline in the late 1940's, and for Zirconium and Hafnium in the 1970's. However it was relinquished in 2001 and data from these previous efforts was only made available in 2009. The Swedish government declared it to be a "Project of National Interest" in 2002 which prevented conflicting land use.

Tasman claimed the ground in mid-2009 and first drilling began in December 2009 with a goal of proving up a heavy rare earth and zirconium resource. The deposit now has in excess of 100 holes amounting to around 12,000 metres. The first NI43-101 compliant resource was released in November 2010 and an updated PEA came out in July 2013.

Zirconium – The Bonus Metal

It is worth digressing into this metal because the traditional focus on Tasman has been rightly on the Rare Earth component but this metal is also an important part of the revenue mix. The closest parallel to Tasman, and an inexact match, is the Dubbo project of Alkane Exploration which in its mix of metals also can boast of being both Rare Earths and Zirconium. Frankly these days having any metals that can add to the value mix is a plus for the economics of a REE project (with Texas Rare Earths being the *non plus ultra* of multi-metal REE deposits).

As we shall discuss further on the Zirconium component makes for a useful percentage of the Norra Kärr product mix. Zirconium is mainly used as a refractory and opacifier,

although it is used in small amounts as an alloying agent for its strong resistance to corrosion.



The principal commercial sources of zircon are Australia, Brazil, India, Russia, South Africa and the United States, however the overwhelming amount of production (80%) of zircon mining occurs in Australia and South Africa. It is estimated by the USGS that Zircon resources exceed 67 million tonnes worldwide and annual worldwide zirconium production is approximately 1,400,000 tonnes. Zirconium is a by-product of the mining and processing of the titanium minerals ilmenite and rutile, as well as tin mining.

Most zircon is used directly in commercial applications, but a few percent is converted to the metal. Commercial-quality zirconium for most uses still has a content of 1% to 3% hafnium. This contaminant is unimportant except in nuclear applications. This brings us back to Boliden's original interest in the Norra Kärr deposit.

According to projections from Alkane Resources the global market of Zircon is worth around US\$2-3bn per annum. It also claims that, during 2014, consumer zircon inventories have been running down, then it expects the market to stabilize through 2015-2016, with a CAGR anticipated at 5%-7% pa over the next few years. Pricing in recent times has been around US\$1,400 per tonne for Zr imported into the US.

The PEA

As mentioned earlier, in July 2013, Tasman released an updated PEA on its main project. The chief findings were:

- an NPV of \$1.46 billion using what the company called a "conservative" metal price assumption
- an in-pit mineral resource of 41.6 million tonnes grading 0.57% TREO (51% HREO/TREO) and 1.7% zirconium in

the indicated category

- 16.5 million tonnes grading 0.64% TREO (49% HREO/TREO) and 1.7% zirconium in the inferred category.
- an estimated mining rate of approximately 6,800 tonnes per year
- a 40-year mine life

The PEA estimated an initial capex of \$266 million for mine construction and start-up working capital (this included a 20% contingency of \$42.8 million). The Norra Kärr project has the advantage of already extant infrastructure including road access, power lines close by as well as rail access within 15 kms. This capex is neither high-end nor low-end. It would probably need an offtaker to be secured and/or a relationship with a nearby processor (as we shall discuss anon).

Operating costs were estimated at \$10.93 per kg of mixed TREO concentrate output.

Tasman has filed and been granted its mining lease for the project and continues to progress on the metallurgical testing that includes the development of a mineral concentrate as well as a mixed rare earth product for separation. The main byproduct of the project is zirconium though Tasman is also investigating the potential sale of nepheline to the glass industry in Europe.

The Revenue Mix

Tasman, like Rare Element Resources, has taken up the practice of using the term, CREOs (critical rare earth elements) to differentiate its product mix from that of the Great Unwashed of the REE space. The company projects that the majority of its future revenue (over 85%) is expected to come from only four major elements amongst the so-called CREOs. These include Dysprosium, Neodymium, Terbium and our old favorite Yttrium.

This is once again a tacit recognition by yet another company in this space that Cerium and Lanthanum are essentially

“throwaways” in the mix, if not deleterious elements (in the financial sense of the word). Tasman asserts that it is not reliant upon revenue from the lower value light rare earth elements, such as Ce and La.

The “Failed” Merger Attempt

Earlier in the year Tasman Metals Ltd. (TSXV: TSM | NYSE MKT: TAS) took the opportunity of the relative strength of Graphite to announce a merger with another company (**Flinders Resources** – TSXV: FDR) in its corporate grouping to corral all the cash into one place and run with two projects at once in the same country. This was an admirable facing of reality. Eventually the cashflow from graphite start-up (which is near to production) would help get the REE project onto its feet. This also tempted us to think that it might make sense to get a Stockholm listing once revenues kick in and lessen the sole focus on TSXV-type investors. However as things panned out the market hated the deal and it came to grief.

The More Obvious Synergy

With the Flinders deal having died the death, it does not mean that Tasman is no longer takeover material. In fact less financial and more synergistic deals could still be mooted. The one that strikes us as most obvious is some sort of arrangement with the 800-lb gorilla in the REE space, Molycorp. The rationale behind this one is simple in that Molycorp owns the Silmet processing plant in Estonia which used to source the bulk of its material from the Russian loparite mines. With those mines in a state of decay, the next obvious source with reasonable proximity is Norra Karr with a rather short maritime voyage away. Molycorp is not in the healthiest of conditions itself these days, but should it survive this current swoon then the synergies between these two assets are pretty clear. It would be interesting to know what sort of savings on the Tasman capex might be able to be achieved by exploring this possibility of a tie-up.

Conclusion

That elusive goal of marketing industry folk, the USP (Unique Selling Point), is now the Holy Grail of Rare Earth companies as well. The hunt is on to find ways to discriminate themselves from the rest and in the process get themselves into the First Class lifeboats. Tasman main things it has going for it are its management's dedication to production, the presence in the heart of Europe, the proximity to Molycorp's Silmet facility, a capex number in the lower half of the project inverse and the hitherto little noted Zircon "kicker" in the revenue mix.

A thought came to us (with our i-banker hat on) that while Molycorp taking over Tasman might be conventional thinking, a better outcome (given the current travails of MCP) might be MCP folding Silmet into Tasman and in the process becoming the largest shareholder in a merged entity. This would create an integrated European REE producer. Just a thought....

Jack Lifton debunks the Lynas and Molycorp rare earth leader myth

I note that the Australian press is reporting today that  Lynas Corp. ('Lynas') will move its administrative headquarters to Kuala Lumpur, Malaysia, from Sydney and close down its other two administrative centers in Australia to consolidate operations in Malaysia. The company's mine, the Mt Weld deposit, of course cannot be moved, but it is not expected to be called upon to produce any new material until the end of 2015. It has accumulated an above ground inventory

sufficient for at least one year of full production by the LAMP operation in Kuantan, Penang Province, Malaysia. I believe that the Mt Weld ore concentrate is now shipped to Malaysia for all downstream processing beginning with roasting.

I think, as a cost savings, this administrative consolidation is a very good idea. Malaysian infrastructure overheads and office costs are far lower than those anywhere in Australia. In addition shipping costs from Malaysia to existing Lynas' customers in Japan and elsewhere in Asia are lower cost, which is anyway one of the reasons that the LAMP was built in Malaysia. I would also say it was a good move for Lynas' public relations in Malaysia except for two things:

1. Given this new target location for Lynas HQ it must be noted that the those Malaysians who vehemently oppose Lynas operations in Kuantan, Penang Province, at the LAMP are always going to be much more likely to stage their protests in Kuala Lumpur than in Kuantan, because Kuala Lumpur is Malaysia's capital and is a far more pleasant venue for protests than what the Australian news media unfairly, in my opinion, call the "peat swamps" of Kuantan, and
2. Because the new CEO of Lynas is a woman making 1.2 million dollars a year.

I was leaving Kuala Lumpur late last year after attending a meeting of the Rare Earth Task Force sponsored by the Malaysian Academy of Science, and when I stepped up to the check-in counter for KLM, the Dutch owned international airline, I was shown a notice that stated that the senior pilot, the captain, of the airliner I was scheduled to fly that evening from KL to AMS was a woman. I asked the check-in person, a Dutch woman, why this notice was posted, since I had never in my life seen any such notice, and she told me that some Malaysians object to a woman having such a position of authority over them. This was an aspect, I was told, of the

Moslem attitude towards women "working in men's jobs" in general. She pointed out that the airline would offer anyone who objected a seat on another flight captained by a man.

I respect anyone's right to live their life the way they want to providing that they give me the exact same opportunity to live my life as I want to. As I boarded the KLM airliner I saluted the tall woman at the entry port wearing the uniform of a senior captain for KLM.

Malaysia is a shining jewel of multi-cultural democracy with a strong adherence to the rule of law and a regard for the rights of personal property in a sea of much less developed nations Malaysia is a country where the GDP is growing at 6% a year. Malaysia is a beautiful country with warm charming friendly people. Malaysia is also a country that although officially secular is majority Moslem. To the best of my knowledge it is the only Moslem country in the world that has a large operational rare earth separation facility, and one of only two countries, the other being the United States, where domestic monazite was processed in the past, but is no longer processed due to the co-production of thorium being considered detrimental to the environment. As I told the Lynas operational people in Kuantan two years ago when the Malaysian Academy of Science asked me to participate in a survey of the LAMP the Lynas problem is public relations and is exacerbated by a bit of tone deafness. The Mt weld deposit is principally monazite. The low thorium levels and the safe disposal of what thorium is produced is what needed to be emphasized to the Malaysian public from day one.

Good luck to Lynas in becoming a Malaysian company in all but name.

Next topic: A recent Reuter's analytical article, "Rare earths industry teeters as Australia's Lynas heads to full ramp-up" posted on InvestorIntel on July 3, 2014, struck me, in some particulars, as misleading for investors of all sizes, and in

other particulars as just plain wrong.

I was struck by two quotations, in particular, in the article:

1. ...“The pressure is on Lynas and Molycorp to demonstrate that rare earths is a viable business,” said Dudley Kingsnorth, a rare earths expert at Curtin University in WesternAustralia, whose forecasts are widely used in the industry...”
2. *And* – A sub-headline of the Reuters’article that reads “[Lynas CEO] Says project profitable even at current depressed prices”

This “projection” of profitability s only mentioned again in the body of the article as follows: “...But more than two years later it [Lynas] has yet to hit stage 1 capacity of 11,000 tonnes a year, racked by opposition to the project on environmental grounds and by technical problems. Once it reaches that rate, Lynas will be cash flow positive, CEO Amanda Lacaze, who took the role in June, said on Wednesday...”

Let’s first look at Mr Kingsnorth’s statement.

I would say that:

In fact the pressure is on both Lynas and Molycorp, which are two different companies with two different deposits and two different business models, to demonstrate that either their own particular or, in fact, any business model that projects a competitive edge in the production and further downstream processing of the light rare earths against the existing Chinese producers in the Bayanobo region of Inner Mongolia can, in fact, be profitable under current conditions of price, existing supply and current and future demand.

Note that I am not saying that the Chinese projects have to be profitable but that, to survive, any non-Chinese light rare earth based project MUST be profitable while selling its own products at or below the delivered cost of Chinese products in

whatever market they are being offered for sale. In short, prices are set by the producers of the majority of the products, who are today the Chinese. We assume that we know Chinese costs but in fact we only know their selling prices. We therefore MUST target their selling prices.

As I said here on InvestorIntel earlier this year ([click here](#)) I believe that both Lynas and Molycorp are too big and in the case of Molycorp, too congested by non-core, irrelevant, inefficient, or non-performing "assets" for either company to achieve competitive advantage over the existing Chinese producers unless security of supply is taken into consideration and heavily capitalized by long term customers. Now as to the statement attributed to Ms. Lacaze, the new CEO, of Lynas, it does not follow, logically, from the statement printed in the article that a positive cash flow equals profitability in the sense of ongoing profitability, or more importantly that such positive cash flow would be or could be sufficient to cover existing debts, working capital, or retained earnings in the foreseeable future picture of rare earth prices and demand.

The attempted (so far) revival of the rare earth industry outside of China got its impetus in 2007 when Chevron divested itself of the moribund Molycorp that it had acquired in 2004 when it bought Unocal.

Molycorp's new owners were financial managers with one exception, Traxys, which is a large resources trading company. I believe that they, the new owners of Molycorp, chose to promote the story that military demand for the rare earths was critical, large, and growing. They may even have believed it. It turns out that this story is not true. The US Military, which by itself, accounts for at least one-half of the world's military budget and is the most technologically advanced military in history has published figures showing that it uses about 150 tons a year of neodymium iron boron rare earth permanent magnets all of which are modified by dysprosium. By

contrast, just the US OEM automotive industry uses 7,500 tons per year of that type of rare earth permanent magnet.

The fact is that today the world supply of the light rare earths that are the only products of the mining operations of both Molycorp and Lynas is in surplus. The Chinese company, Baotou, has said publicly that by itself it could supply the entire global demand for light rare earths indefinitely. Of course it would ONLY continue to be able to do so if it remains the lowest cost producer and if the Chinese government allows export volumes to be determined by market forces.

If China adheres to the recent WTO decision then Baotou's cost structure at the moment, as reflected in its pricing, will allow it to continue to dominate the global market. Note that In the last reporting year even though prices for the rare earths fell dramatically from their previous year's levels Baotou still made a small profit.

In fact though it has become obvious that the future geography of the global rare earth supply chain will depend on deposits that can produce mid-range (SEGs) and heavy rare earths (HREEs).

[SEG is shorthand for Samarium, Europium and Gadolinium – the mid-range rare earths all of which have product uses: magnets, phosphors, and medicine.]

I am going to predict that those non-Chinese deposits being developed to produce the most SEGs and HREEs, as a percentage of their total production, have the best chance of also becoming profitable producers of LREEs.

Almost all of the HREE developments can or would produce some LREEs. The critical nature of the HREEs, even in the Chinese domestic markets, makes it likely that SEG/HREE producers will also be able to sell their LREEs to their customers using the time-honored Chinese developed sales method of "if you want dysprosium you must also take neodymium. If you want a better

deal or an assured supply then you must take lanthanum as well.”

Molycorp’s original business model took no account of HREEs; this flaw has dogged the company all along. Acquiring (or as seems more and more likely being acquired by) Neo materials gave Molycorp some Chinese HREE processing capability but no HREE new material sourcing capability whatsoever. For whatever reason this flaw has not, even now, been fixed although it could have been easily fixed many times. It is probably now too late, financially, for such a fix to rally the market.

Lynas is in a similar predicament. The company has, however, among its Mt Weld properties significant HREE bearing deposits. Even the Mt Weld material contains 5% of SEG/HREEs. At 11,000 tons per annum the output of the LAMP would include 550 tons per year of SEG/HREEs. Neither Molycorp nor Lynas has any non-Chinese capacity for downstream processing of SEG/HREEs. But only Lynas would immediately have any to process in any case.

Therefore I predict that end-users looking for non-Chinese materials will focus on the total output of the right sized producers now in late development. I think that North American domestic demand for ALL rare earths will be filled by the operations of one of or all of Rare Element Resources, Texas Rare Earths, and Ucore. A successor-in-interest to today’s Molycorp may well produce some light rare earths from its dedicated mining operation if the separation facility at Mountain Pass can be stripped of its global overheads and accumulated debt. The facility there would be an ideal location for tolling without those global overheads. It would of course have to be upgraded to be able to process HREEs.

I think the LAMP, shorn of debt and global overheads, would also be ideal as a central LREE tolling operation, but it would, as would Molycorp, by the way, have to add a hydrometallurgical engineering group to adjust the plant’s

operations for different feed stock compositions. Ideally a Malaysian group might take over the LAMP or partner with existing management and build a SEG/HREE downstream processing facility on the property. In fact a total rare earth supply chain could be constructed on the basis of the LAMP to serve all of non-Chinese (Austral) Asia with hydrometallurgy, separation, metal and alloy making, and magnet and specialty alloy and chemical production. Australian HREE juniors such as Northern Minerals might and should look towards a Malaysian central processing facility I will go out on a limb and predict that one or the other of the above scenarios will come to pass. Perhaps even both.

I don't want to leave out Europe, so let me say that it is possible that Solvay might turn La Rochelle into a central processing operation anchored upon the production from Tasman in Sweden and from AMR in Turkey. It is more likely today than in the recent past that a third party will set up a central European processing (tolling) operation using not only Tasman and AMR feed stocks but also some from Russia or Central Asia. The common problem for all toll refiners is "normalizing the feedstocks." This is not a trivial problem, but it is not insurmountable. It does, of course add cost. Lastly, my Canadian friends (and relatives) might wake from their slumber and promote the creation of a central Canadian tolling facility for the rare earths. This would completely change the dynamics of costing most of the Canadian located rare earth junior mining ventures.

Did I mention that both Africa and South America can produce the lowest cost LREE ore concentrates, and, in at least two instances already do so as a consequence of existing very profitable operations?

There's a whole lot going on in the non-Chinese rare earth sector that has nothing to do with the mining operations at Mountain Pass or Mt Weld.

I think that the non-Chinese world is on the cusp of putting into place the right ideas to process the right amounts of rare earths from right-sized and right-proportioned rare earth deposits. I won't be too surprised if Chinese investors make the first credible overtures to achieve this goal. I will be surprised if non-Chinese governments make such investments easy.

Please, *please stop thinking* that either Molycorp or Lynas have the "right" model and that the entire rare earth industry outside of China will rise or fall with their survival or lack of it. In fact both companies are stuck in a rut. The rare earth business model has not been static.

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