

Mt Marion: A Lithium Super-Pit in the Making?

When the latest drill results produced by the partners of Neometals Ltd. (ASX: NMT) in the Mt Marion project crossed our desk last week we couldn't help but be impressed by the length and the grade of the intercepts. The next thing that struck us was the depth so we shot off a query to the company as to whether this implied that an underground phase might be warranted. The response came back that Greenbushes Cornwall Pit is down that deep so underground does not need to be considered. That pit is of course the Talison asset which is now carved up between Tianqi and Albemarle. On Mt Marion, the added nugget we were given was that, given the ultralow strip ratio, the pit will just get bigger/deeper. This got us thinking that Mt Marion could end up being massively larger than currently envisioned with a significantly longer life span. The corollary of this is that the residual stake that Neometals owns will be worth that much more and the temptation of the partners (particularly Ganfeng) to take Neometals out with increase. It is worth noting that Talison was taken over for over AUD\$700mn when the AUD was higher against the USD.

In this review we shall look at the latest drill results and hopefully get some colour by looking at the nearest comparable for Lithium superpits, the Cornwall mine.

Latest Results

The news that spurred us to dig deeper (excuse the pun) was the results of a program of deep Reverse Circulation drilling at the Mt Marion project has intercepted significant, deep, spodumene-bearing pegmatite in consecutive drill holes along a south-westerly trend at Area 2 West. It was a single fence of four, soon to be five, holes.



Assays received to date include the following significant intercepts:



Assays are pending for pegmatite intercepts 0-27m, 52-122m, and 172-369m in MMRC0394.

The fifth hole, PROP803 (MMRC0395) was due to commence drilling on 19 May 2016 on strike of the drill holes detailed above and which appear in the oblique drill section. The cross-section of the results looks like this:



The partners had previously indicated that planned infill and extension drilling program would prioritise the near surface mineralisation however it has been worth the effort to go deeper as the current RC drilling has defined previously unknown deep mineralisation. The striking of this mineralisation trends towards the processing plant location.

Due to these favorable results the partners have decided upon a new extension drilling exploration program to commence immediately with a nominal value of AUD\$4mn and with an anticipated completion timeline of around four months ensuring a flow of news.

The effect of the results from the holes already drilled should be evident soon as new Mineral Resource and Mining Reserve estimates will be prepared with anticipated release of results to the market by the end of June 2016.

Greenbushes – The Mother Lode

In looking at how big a Lithium open-pit operation can be the key reference point is the Cornwall Pit of Talison Lithium in the Greenbushes area of Western Australia. The mine is based

in a zoned granitic pegmatite. The main Greenbushes pegmatite is 2,500 metres long and 61 to 244 metres wide, trending north north-west. It is classed as a large LCT complex pegmatite (spodumene sub-class), is severely deformed, recrystallised, deeply weathered and fine grained to a point where it is difficult to map out the zonation. Two main zones are present:

- Albite / Ta-Sn zone
- Spodumene zone (hanging walls of the main pegmatite)

This deposit has been mined almost continuously since tin was first discovered at Greenbushes in 1886. Indeed, Greenbushes is recognized as the longest continuously operated mine in WA.

The first phase was tin mining from the 1880s until recent decades. Then Tantalum mining started in the 1940s with the advancement in electronics. Tantalum hard rock operations commenced in 1992 with an ore processing capacity of 800,000 tpa. By the late 1990s demand for tantalum reached all-time highs and the existing high-grade Cornwall Pit was nearing completion. In order to meet increasing demand a decision was made to expand the mill capacity to 4mn tpa and develop an underground mine, to provide higher grade ore for blending with the lower grade ore from the Central Lode pits.

An underground operation was commenced at the base of the Cornwall Pit in April 2001 to access high-grade ore prior to the completion of the available open pit high-grade resource. In 2002, the Tantalum market collapsed due to a slow-down in the electronics industry and subsequently the underground operation was placed on care and maintenance. The underground operation was restarted in 2004 due to increased demand but was again placed on care and maintenance the following year and have remained so ever since.

The mining of Lithium minerals is a relatively recent event with the commencement of production of lithium minerals in 1983 and commissioning of a 30,000tpa lithium mineral

concentrator two years later in 1984-1985. Production capacity was increased to 100,000tpa of lithium concentrate in the early 1990s and to 150,000tpa of Lithium concentrate by 1997, which included the capacity to produce a Lithium concentrate for the Lithium chemical converter market. The Lithium open pit operation has continued throughout recent times and mining is now focused on the Central Lode zone. Only Lithium minerals are currently mined from the open pits. To get an idea of the size of the Cornwall here is a photo. 

Conclusion

In Western Australia they do things on a grand scale. They have taken down a few mountains to ground level in the extraction of iron ore and Kalgoorlie's super-pit is the epitome of mining of Pharaonic proportions. As the Cornwall pit has set the standard for bigness in lithium mining, the upcoming Mt Marion mine of Ganfeng/Neometals has a model to aim for. Up until now there were not the grounds for talking of Mt Marion matching Greenbushes but the latest drill results show that potentially the pit shell might be boosted in various directions giving Talison a run for their money in claiming to have the definitive Lithium super-pit.

Tantalum – Conflicts of Interest

Like so many other things out of the US, a good idea often ends up coming out less than well-thought-out in the final wash. The last 20 years saw a rising tide of bad press for 'conflict minerals' with the film *Blood Diamond* topping off the trend and finally stirring some official action. As is so

common, the focus ended up being a highly publicized region and a few prominently mentioned minerals and as time (and conflicts) “moved on” the original purpose became obscured and various conflicts and minerals flew under the radar.

These days the focus on conflict minerals is concentrated on Tin, Tantalum, Gold, Diamonds and Tungsten. Indeed these were encompassed in the behemoth Dodd-Frank law which was supposed to fix the ailments of the US financial system in the wake of the 2008 debacle and ended up in true Washington fashion being a catch-all for pet-projects and waif-and-stray measures that couldn't find a legislative life of their own. The 2010 Dodd–Frank Wall Street Reform and Consumer Protection Act requires manufacturers to audit their supply chains and report conflict minerals usage.

The perversity of this, as I have pointed out before, is that in Burma around 10% of the world's supply of Antimony is produced artisanally by rebel tribes then smuggled into China where it is paid for with arms, or money to buy arms to fight the Burmese government. There is no more classic example of a conflict mineral – yet neither Antimony, nor the region, are within the ambit of current conflict mineral restrictions. Maybe if a film with Johnny Depp came out on the subject it might get some traction.

Exotic Supply Sources

We shall focus here though on Tantalum, by far the least known “household name” in the conflict minerals space. As can be seen by the pie chart below showing sources of current production there is a heavy preponderance towards Africa as a supply source with a very high proportion of production emanating from those hot-spots of the last 20 years, the DRC, Burundi and Rwanda. Mozambique is no longer unrespectable but for a long time was riven by civil war and Nigeria has been an on-again, off-again trouble spot currently tormented by the Boko Haram movement. This puts the vast majority of tantalum

production in the category of conflict minerals.



It might be said that there is a swathe of quasi-artisanal sources in Africa, and secondary by-product sources making up much of the rest of global supply. Some of this by-product flow comes from the large-scale producers of niobium, CBMM (in Brazil) and Niobec (in Canada), with the ore at these mines also yielding a small percentage of tantalum. Tantalum is also produced in Thailand and Malaysia as a by-product of the tin mining there. The slag from the tin smelters then contains economically useful amounts of tantalum, which is leached from the slag.

It is worth mentioning that the “major” producer of Tantalum in North America at the moment is the Tanco Mine, owned by Tantalum Mining Corp. of Canada (Tanco), a subsidiary of Cabot Corp (NYSE:CBT). This is an underground cesium and tantalum mine on the Bernic Lake, Manitoba, Canada.

As far as up and coming projects are concerned, those on our radar include MDN’s Crevier project in Quebec, the Woodgina project and Alkane’s Dubbo project in Australia and Tantallex’s Mayoko project in the far north of Brazzaville Congo. The latter has only recently come to our attention. A key point to note here is that Brazzaville Congo is the old French Congo and NOT to be confused with the DRC (which is the old Belgian Congo).

A Rare Element Indeed

On the more practical side Tantalum is a chemical element with the symbol Ta and atomic number 73. It is a rare, hard, blue-gray, lustrous transition metal that is highly corrosion-resistant. Tantalum is estimated to make up about 1 to 2 ppm of the Earth’s crust by weight. Tantalum, always together with the chemically similar niobium, occurs in the minerals tantalite, columbite and coltan (a mix of columbite and

tantalite).

Applications – A Very High-Tech Metal

Tantalum is part of the refractory metals group, which are widely used as minor components in alloys. The chemical inertness of tantalum makes it a valuable substance for laboratory equipment and a substitute for platinum. Tantalum is also used for medical implants and bone repair. Its main use today is in tantalum capacitors in electronic equipment such as mobile phones, DVD players, video game systems and computers.

One could almost argue that it is like some of the rarer REEs and Scandium in that further applications are restricted because of supply issues, not by human ingenuity. For this reason the current squeeze on supply by the implementation of anti-conflict mineral measures just makes the metal even tougher to source.

As can be seen from the price chart, the metal has had a fairly attractive chart, compared with other metals, in recent years.



It is estimated that there are less than 50 years left of tantalum resources, based on extraction at current rates, demonstrating the need for increased recycling.

The intriguing thing about Tantalum is its fluctuating supply. The chart below shows supply over recent decades and it's been a wild ride. This irregularity of supply also gives a good reason why inventors of applications may be wary of creating some new usage that cannot then be supplied.



Conclusion

Tantalum appears to be one of those technology metals where expanded supply will probably expand demand commensurately. Recent decades have seen the metal constrained by occurrences and production being skewed towards zones of conflict.

The metal has thus become enmeshed in the conflict minerals issue with a predomination of artisanal and clandestine producers over listed mainstream (respectable?) miners. There is a fine line to draw in the whole area of "exploitation minerals" which in quite a few cases includes artisanal mining where dubious middle-men are involved. If there was a crackdown on exploitation of the artisanal sector globally, then the party most likely to be negatively impacted would be the Chinese. The US can't be too aggrieved to see Chinese manoeuvres in shady metals trading being cramped by Dodds-Frank.

So Tantalum is tantalizingly scarce both as a metal and as an investable option. While investors have a choice of number of companies with deposits, those with production are a distinctly rare commodity. Hopefully this situation will change over the next few years.